

## **Effects of Relational and Personal Network of Tunisian Contractors On Access to External Resources**

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**Abstract:** *This paper aims to analyze the benefits of relational and personal network of a contractor in terms of his access to external resources. The originality of our approach lies in the choice of the context in which our empirical analysis is applied, and relative to the Tunisian context. In addition, we have integrated a range of theoretical approaches that have examined the concept of relational and personal network, particularly, the strength of ties of Granovetter (1973), the theory of structural holes of Burt (1992) and the theory of social resource.*

**Keywords:** Relational and personal network, external resources, contractor, Tunisia.

**JEL classification:** M12; M14.

### **Introduction**

In a globalized, open and increasingly competitive economy, the mobilization of the relational network is essential especially for SMEs. These SMEs are often presented as an organization without means of action, because of its size. To this end, one of the levers to overcome these limits lies in the ability of staff to mobilize its contacts, relationships, to acquire the resources necessary to the performance of its business. In general, social relations and personal contacts that individuals develop throughout their lives have a value to their organizations as they provide access to advantages and various benefits.

This is why we feel it is appropriate in this chapter to analyze the link between the mobilization of the relational network and access to external resources. To do this, this paper is organized into three main paragraphs: first, we will try to review the literature that analyzed the relational network. Then, we will focus in the second paragraph on the impact of the relational network access to external resources. Finally, we will try in the third paragraph to empirically analyze this link by referring to the most appropriate statistical and econometric techniques.

### **Theoretical framework of the concept of relational and personal network**

The literature on social networks is abundant and it contains a number of theories and approaches to identify this area. In fact, the concept of the relational network has been rigorously analyzed by three branches of research: The strength of ties of Granovetter (1973), the theory of structural holes of Burt (1992) and the theory of social resources.

According to Granovetter (1973), the concept of the strength of ties is apprehended as "a combination of the amount of time, emotional intensity, intimacy and reciprocal services which characterize these ties." This concept was taken up later by Chollet (2002) focusing specifically on the nature of the strength of ties, low or high.

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## Effects of Relational and Personal Network of Tunisian Contractors

Chollet (2004b) states that weak ties are only effective by themselves, but the proportion of weak ties in a network and therefore, the structure of the personal network, which is important. However, much research in sociology and management science adopts Granovetter's approach to say that "the weak ties are not good because they allow reaching distant individuals in the social structure, but simply because that they involve specific dyadic relationships that have value in itself".

Moreover, to describe the relationship between the strength of ties and the concept of the relational network, Granovetter (1995) has shown that it largely determines the resource acquired by a contractor. In this regard, this author argues that despite its type of low, these links in the form of a simple contact with certain people can lead to intimate relationships, as well as on the basis of hazardous knowledge, there may be an accumulation of a set of high-value information and identification of new opportunities. In contrast, the strong type of ties from relationships with close friends may be the cause of the closed areas because the friends of my friends are my friends because the opportunities which we see are large in which information can be spread with a more intense pace, but redundantly.

Granovetter (1973) appreciated four dimensions of the strength of ties: The amount of time, emotional intensity, intimacy, and reciprocal services. The types which are often adopted are the frequency of contact and the emotional intensity. By testing three of these four dimensions, Marsden and Campbell (1984) concluded that the perfect indicator to measure the strength of a link is the emotional intensity. For his part, Johannisson (1986) proposed a range of other indicators, namely the regularity of the use of relationships, level of maturity, confidence, and nature of past experience. Moreover, Janssen and Koenig (2002) quantified the strength of a link by the degree of friendship by claiming that knowledge refers to a weaker link while a friendship refers to a strong link.

Regarding the theory of structural holes, Burt (1992) is interested in studying the overall structure of the personal network of Ego. For this author, it is the rich network structures in structural holes that are most effective. The concept of structural holes indicates the absence of links between non-redundant contacts that is to say the contacts that facilitate access and to people or other resources. For Burt (1992), this type of structure promotes access to a competitive advantage, particularly when it has more exploitable opportunities in terms of information, control and visibility (Degeenne and Forsé, 2004).

However, when a given structure is rich in structural holes it allows people to better access to relevant information and exploitation of opportunities, particularly preferred from the side of moving up of Ego (Burt, 1992). For his part, Coleman (1988) considers that a dense network is likely to implement a regulatory framework for the individual facilitating a better understanding of the expectations of the structure to which it belongs and a greater absorption of the values of the latter, which has a positive effect on his career (Podolony and Baron, 1997).

Finally, the theory of social resources was established a priori by Lin, Ensel and Vaughn (1981). For these authors, it is not the nature of the link itself will assist the individual in achieving his goal, but the resources available through this link. This theory of social resources is part of the pyramidal vision of a society of Bourdieu in which the more one is at the top of the pyramid the more resources are obtained. An interpretation that can be made of this theory is that the more the person with whom you are in contact is highly placed in the organization compared to the Ego, the more it will bring him useful resources. This theory can also be applied in a horizontal vision of the organization.

In this regard, the attributes of the contact (Chollet, 2005) are highlighted and that can arise through many configurations, depending on its function or organizational unit (Seibert et al., 2001; Cross and Cummings, 2004; Chollet, 2005), its level (Seibert et al 2001; Cross et al., 2004; Oh et al, 2004), its field of technical qualification (Rodan and Galunic., 2004; Chollet 2005), or its geographical position ( Chollet, 2005).

These three theories indicated are strongly related. Indeed, the theories of Lin and al (1981) and Burt (1992) are continuations of the theory of Granovetter (1973).The first two theories, processes the non redundant as a characteristic of personal network of the individual. By opposition, in the social resources theory the attributes of contacts are different from those of Ego and have applied them in the structural holes theory. The strength of weak ties is only one way to get that non-redundancy, in particular with the principle of homophily (McPherson and Smith-Lovin, 1987) that characterizes relations.

### **The role of the relational and personal network in access to external resources**

The resources are the cornerstones of the existence and growth of a business (George, 2005 and Penrose, 1959). To this end, Barney (1991) distinguishes between three categories of resources which are physical capital resources, human capital resources and organizational capital resources. For his part, Moore (1996) conducts another classification between intellectual resources, physical resources and finally capital resources. This classification is wider in Greene analysis, Brush, and Brown (1997), by distinguishing between six categories of resources which are human, social, financial, physical, technological and organizational resources. In fact, these resources were also subsequently recommended by Hite and al. (2006) but adding those of political and intellectual type.

Furthermore, Burt (1992) highlighted three categories of resources in the entrepreneurial process: First, the financial resources they are cash, bank deposits, credit lines. Then, human resources in the form of the possessed skills, charisma and intelligence, strengthened by the skills acquired through experience and education. Finally, social resources originating from the different relations of the contractor with the other people in the form of contact with friends, colleagues and customers from which arise new opportunities transforming human and financial resources into profit.

Many studies have shown the essential role played by personal networks of entrepreneurs in the elimination of informational and institutional gaps and effective mobilization of external resources (Lallement & Bevort 2006; Mercklé 2004; Lazega, 1999). This idea was previously advocated by Dubini and Aldrich (1991, p.306) who argue that "Mobilizing Resources to pursue opportunities requires contacts, knowledge and confidence. Mobilizing resources also mean asking others to provide resources and efforts to a company whose future is uncertain. Entrepreneurship is therefore essentially a networking activity.

The potential impact of personal network of contractor on resource access requires an analysis of the parameters characterizing the latter. To this end, three parameters are considered crucial to know: First, the size of the network, which is the number of people who belong to the home network. Then, the density of the network of relationships which expresses the ratio between the number of links between its members taken in pairs and the total number of potential links if all network elements are interlinked (Aldrich, Zimmer, 1986). Finally, the diversity which reflects the heterogeneity of the members of the network. This notion is with a variable geometry, since we can remember absolutely any heterogeneity criterion: the differences

between network members may be age, sex, nationality, career, social status, etc...Our main objective throughout our research is to validate the following central hypothesis:

*H.1: The relationship network of the contractor positively and significantly affects his access to external resources.*

### **The network size and the access to resources**

Most studies agree on the positive impact of the size of personal network on the access to resources. But given that the measures of personal network are different, network of discussion (Aldrich et al., 1987) or "active" network (Hansen, 1995) M41, the results about the average size of the network, diverge.

Thus, Aldrich and al. (1987) found an average of 17 contacts. For Hansen (1995), a network consists of 2-19 members. Furthermore, the study of Aldrich and al. (1987) was, thereafter, duplicated in different countries and give different results. So it seems that network size is very heterogeneous. The research of Greve and Salaff (2003) is original since, unlike other studies, network size is the dependent variable in their study and the independent variables are the step in the creative process. Thus, they show that while the idea matures, the network is small (on average, 8 contacts), it becomes maximum (average 14.7 contacts) during the project preparation phase and then, decreases during the boot of the business (on average, 12 contacts).

The impact of the proportion of strong and weak ties in the relational network on entrepreneurial success is undoubtedly one of the most debated topics in the course of the "embedded" entrepreneur. If the Granovetter's theory (1973) on the strength of weak ties is very applicable to the case of job search, it has been less empirically verified in the context of creating a business. Indeed, the entrepreneurial situation implies access to kinds of resources which are different from those necessary for job search, including resources that can be more risky to alter.

Network size is the number of different people related to a contractor during the creation process. If we assume that the objective of directed information research is difficult and that chance is critical in obtaining information (March to March 1978), many network people increases the chances of receiving of useful information. Therefore, the size of the network can be one of the most important variables to explain the successful establishment of new businesses. Connected to the size, but also independent of the size, is the time that people spend to develop and maintain a network of contacts. With a large network, the time for each person can be smaller, with a small network, a person can use more time with each person. Luckily, there may be a better chance of picking up useful information by passing a small amount of time with a higher number of people.

Neegard and Madsen (2004), Shaw (1997), Shaw and Conway (2000), Singh (2000) and Burt (2000) found that large networks with a high number of contacts are important enough to develop entrepreneurial projects as enable them to access resources held by the other players on network (2007). Baron highlighted that over the contractor's network is wide, the better is the access to information resources, including those relating to the recognition of opportunities. In light of the above ideas we will try to validate the axial following hypothesis:

*H.1.1: Access to external resources is even greater if it is supported by an extensive and broad network of relationships.*

### **Network density and access to resources**

The criterion of density is often associated with a rapid flow of information (Aldrich, Reese, Dubini, 1989; Cromie, Birley, 1992; Greve, 1995). The personal network of maximum density, when it is composed of people who know each other, and minimum density, if the contractor is the only member of the network each of which has relations.

A low density network means that the contacts (alters) of the focal person (ego) in the network do not know very well, and therefore the likelihood of redundant information is lower. Redundancy is also a function of the degree of homogeneity of the people on the network in terms of training and work experience. Another problem is their willingness to share information. This later is rarely a problem in high-density network, which can be a clique (Scott, 1991). An advantage with low-density networks is that each alter ego can connect to other groups that are usually not connected to each other. These links are called bridge alters which can connect two subgroups (Mintz and Schwartz, 1985).

In high-density networks, contacts with his primary contacts (alters) tend to be people who are already connected. Low density networks can provide access to many people by bridges and less redundant information (Granovetter, 1973, 1974, Granovetter, 1982 and Burt, 1992). Centrally located in a local cluster, means that information is available through many direct contacts. This means that the more Alters are connected to each other, more contacts are redundant and the network is denser. Chollet (2002) presented density as the ratio between the numbers of links between members of the network took two to two and the total number of potential links, if all members of the network were related. Reagans and McEvily (2003) have previously shown that the more a bond is characterized by a dense relational environment, more the transfer of knowledge between it and those of its environment, is easy.

Uzzi (1997) and Ahuja (2000) also suggested that two people with a dense network data are generally encouraged to cooperate because they are both related to other individuals who could take sanctions against opportunistic behavior. However, Burt (1998, 2000) puts in perspective that the density of a network increases its closure and thus, promotes the likelihood that its contacts share and know the same information, and therefore, redundant information. So we can formulate this hypothesis:

*H.1.2: The greater the density of the personal network of entrepreneurs, the greater access to external resources.*

### **The number of structural holes and access to resources**

For Burt (1992), what is important for an actor, it is the number of non-redundant contacts which are held. Reflection incurred puts into perspective the concept of structural hole which is a central concept in the design of social capital and designates a void or absence of relations between two non-redundant contacts. Burt also points out that if the social structure of an actor is rich in structural holes, it can interpose intermediate between non-redundant contacts so as to become a bridge or forced passage point between each duality contact. Burt (2000) highlights that network rich of structural holes allows the entrepreneur to have an easier, faster and better control of information.

In 2005, Burt says that structural holes have three kinds of benefits: A faster access to information, a better information (the information is not redundant to each side of the hole), more control over the dissemination of information.

For their side, Bhagavatula and al. (2010) have shown that companies operating in a volatile environment, rich in opportunities benefit a number of structural holes, enhancing its ability to acquire more resources. We therefore propose the following hypothesis:

*H.1.3: Access to external resources is even greater than the number of structural holes in social capital is higher.*

### **Nature of social relationships and access to resources**

Any individual who has a social network has many direct links with other people in this network. The impact of the proportion of strong ties and weak ties in the personal network on entrepreneurial success is undoubtedly one of the most debated topics in the course of the "embedded" entrepreneur. However, the results are very divergent. Several methodological explanations may in part explain this lack of consensus. First, the strength of the link is not measured in the same way according to the authors. Then, some were interested on the effects of the proportion weak links / strong links while others have questioned whether the intensity of a link implies specific dyadic relationships. These links can be, according to the categorization made by Granovetter (1973, 1982) of strong ties or weak ties.

Unlike weak ties, strong ties are associated with the ability to inspire confidence. They refer to a rich network of shared emotions and confidences exchange (Granovetter, 1973; Levin and cross, 2004). The benefit of strong relationships is that they are social and moral support whose contractor often needs in difficult times by providing reliable, valid and valuable information. In fact, the emotional ownership of a strong link to the contractor gives a more complete understanding of the behavior of his contact and reassurance about the credibility and trustworthiness of the information which it provides. We can then provide that information from people that the ego is connected by strong ties, are reliable as they are from people worthy of loyalty characterized by high levels of interpersonal trust, affection and attachment and are generally made with "intimate" knowledge that the individual can count (spouse, parents, close friends ...) and what he spends a lot of time because they are emotionally close to him.

Thus, these strong ties characterized intimate knowledge of the individual that according to Krackhardt (1992) consists of two components: the frequency and the duration which sets a "lived relational "increasing the knowledge of a party by the other.

Granovetter (1973) with his study of the weak and strong ties and their impact on job searching found that the information circulated via weak ties is cool and not redundant. In the same line of ideas, Plociniczak (2001, p.20) adds that "weak ties allow more than strong ties to go out from the relational context in which the actor is inserted and provide access to unpublished contacts. A weak link is a gateway, if operative, to escape from a closed social system and obtain a renewed information. "

More the contractor is supported by a large number of weak links, the more he will have the chance to have access to fresh and non-redundant information on international partnership opportunities. Therefore, openness to other individuals, other social groups through weak ties, allows access to more original and less redundant information.

Some researchers have argued for a closed rich network of strong ties as Aldrich (1995), Hansen (1999), Reagans and McEvily (2003), Inkpen and Tsang (2005). From their point of view, these strong ties draining benefits in terms of tacit knowledge transfer ( B. H. Tarek and A. Sami, 2014 and Uzzi, 1997), exchange specific information (Krackhardt, 1992; Starr and MacMillan, 1993) and reliable funding (Choy, 1990; Jenssen and Greve, 2001; Batjargal and

Liu, 2004). Differently to Granovetter (1973, 1982), Burt (1992) showed that weak ties building bridges between different media, allow individuals to take advantage of many opportunities available to them and promote social cohesion and access to different circles of information. These are the weak links, sparse, existing between distinct social groups that provide more access to information and separate resources (Mercklé, 2004). Based on the fact that we have conflicting results on the effectiveness (or not) of strong ties or weak ties with respect to access to resources, several subsequent studies have attempted to reconcile these opposing views, stressing that a mix of strong and weak ties would be better to achieve the objectives of any business, showing that it cannot be confined to a single class of bonds at the expense of another (Uzzi, 1997; Rowley et al 2000; Hite and Hesterly, 2001 Elfring and Hulsink, 2003). Based on these ideas, we could advance the following hypothesis:

*H.1.4: More ties are strong, more access to resources is important.*

**Quality of social relationships: Role of the diversity of attributes of alters in access to resources**

Lin (1999), in his theory of social resources, advance that one might call "good network" as the network is able to bring together alters with significant resources and is the product of their higher status, their high levels of prestige, and their demographic, organizational, professional, technical attributes. The wealth of the social network is also dependent on the socioeconomic characteristics (prestige, wealth, social status...) of actors that comprise it (Batjargal, 2001).

To this end, the contractor is required to identify relationships to focus on and avoid those time-consuming. This diversity suggested by Lin (1999), being with a variable geometry, it refers to the heterogeneity of members on several criteria such as age, sex, nationality, career...

Julien and al. (2004) also reported that a network composed of members almost alike or have the same ideas is not rich because it typically generates redundant ideas and so, few new ideas.

Anyway, a good network should include heterogeneous members, bringing different ideas. However, the heterogeneity without depth, that is to say, without quite frequent exchanges prevents a better understanding between members and thus maladaptive responses to stakeholders (Degenne Ditch and 1994). The quality is measured by the ability of members of a network to provide rich information, that is to say, new, decoded and adapted information (Weick, 1993). More diversity is high (Aldrich and Zimmer, 1986), more information is concerning expertise in the field rather than peer (Rueff, 2002), and more information is coming from more than one channel (Nonaka, 1994), and the entrepreneurial team is able to absorb this information (Zhara and George, 2002).

The study of the diversity of the network is based on the social resource theory of Lin (1995, 2001). For Lin (2001), a social network is useful when resources held by alters are useful for ego. This issue of the impact of network diversity refers to the theory of Homophily (McPherson and al., 2001, cited by Borgatti and Foster, 2003). Homophily is the tendency to interact more with people who are like us, same age, same race, same level of training, etc... This tendency toward homophily has positive effects: it facilitates the transmission of tacit knowledge, simplifies the coordination and avoids potential conflicts.

But on the other hand, limiting the communication with different people, leads to a uniform method of thinking and can maintain inequalities. As a part of a business, the diversity of alters was measured by different variables: gender, age, ethnicity, function, job, etc. (Aldrich,

2000, cited by Minguet and Moreau, 2006). Others approach it in terms of the industry in which alter belongs to (Butler and Hansen, 1991). Based on these ideas, we could advance the following hypothesis:

*H.1.5: The greater the diversity of the relational network, the greater the access to external resources*

**Results and discussion**

It should be recalled that in our study, we have established the choice of analytical methods according to the reference sample. We used the nonparametric and simple regression. Indeed, the sample divided into two groups of sample results in a decrease in the number of observations of individuals. Given this, it is necessary to mobilize adequate statistical tests (parametric tests / nonparametric tests).

This research is based on two components. The first, it is to check the change in the model variables for the two age categories (less than 40 years old and above 40 years). In this phase of the analysis, the sample will be divided into two groups (variable according to age). Nonparametric tests will be applied. The goal is to study the quality of cause and effect between the dependent variable and the explanatory variables contained in the research hypotheses. We will focus on testing hypotheses regarding the change of variable age of contractors.

**Table 1: Characteristics of scales mobilized for the variable "Structure of the relational personal network"**

<b>Variables Features</b>	<b>Network functionality****</b>	<b>Network size ****</b>	<b>Frequency of contact ****</b>
Number of items*	4	3	2
Scope of the item	1-3	1-4	1-4
Scope of the scale **	4-12	3-12	2-8
Number of observations Age<40 years.	10	10	10
Number of observations Age≥40 years	22	22	22
Sum scores Age<40 years	91	161	137
sum scores Age≥40 years	437	376	391
Average Age <40 years***	6.919	3.376	3.461
Average Age ≥40 years***	18.967	17.524	3.698

Number of items mobilized for the calculation of the scores;

\*\* Extent of the item of the scores obtained by constructing synthetic indicators;

\*\*\* Average of the sum of the scores for each group of the sample;

\*\*\* Variable considered before the factor analysis;

\*\*\*\* Variable considered after the factor analysis i.e. by construction of synthetic indicators on the items with the highest contributions to the main factor axes.

To test the hypothesis concerning the variability of the components of the structure of the relational personal network for both age groups studied, we operationalized the Mann-Whitney Wilcoxon for two sample groups, divided according to the criterion age. The aim is to what extent the structure of a relational personal network change from one age to another (below 40 years old / upper 40 years).

We constructed composite indicators on which we applied the tests of scores of ranks. Of course, the study of the conditions of application was the subject of a pre-analysis review. Table 1 specifies the characteristics of scales selected for the study of the structure of the components of the personnel relational network.

For the variable "Network Functionality" rank test by age group shows that the average score for the sample of mean age less than 40 years of age is 6.91, while that for the sample of the average age above 40 years is 18.96. We resumed the scores of condensed items after the results of the factor analysis.

The Mann-Whitney and Wilcoxon test is significant at the level of 1%, which confirms the hypothesis that the two groups of contractors from two different generations according to the criterion "Structure of relational and personal network". In addition, the Kruskal-Wallis test is significant at the level of 1%, reflecting the generalization of the difference in the structure of the relational network between the two categories of contractors.

The result of the Mann-Whitney and Wilcoxon test on equal scores obtained from the three item shows that the two age groups vary in terms of structure of relational and personal network. The probability of being wrong in rejecting the null hypothesis is less than 0.01%. We conclude that both age groups have different significant judgments in the network size.

**Table 2: Summary of results of non-parametric tests on the "structure of personal and relational network"**

<b>Variables Tests</b>	<b>Network functionality ****</b>	<b>Network size *****</b>	<b>Frequency of contact ****</b>
<b>Test of Wilcoxon (two groups of age)</b>			
Statistics (S)	264	528	264
Normal approximation	4.938	4.924	4.659
Z*	0.000	0.000	0.000
Pr≥Z(unilateral)			
<b>Test of Kruskal -Wallis</b>			
Chi-deux	9.051	12.26	1.296
DL	1	1	1
Pr≥Chi-deux	0.0026	0.0008	0.74

Number of items mobilized for the calculation of the scores;

\*\* Extent of the item of the scores obtained by constructing synthetic indicators;

\*\*\* Average of the sum of the scores for each group of the sample;

\*\*\* Variable considered before the factor analysis;

\*\*\*\* Variable considered after the factor analysis i.e. by construction of synthetic indicators on the items with the highest contributions to the main factor axes.

## Effects of Relational and Personal Network of Tunisian Contractors

The Kruskal-Wallis test shows a chi-square value of 12.26 with probability p-value = 0.008. In other words, the difference observed in the structure of relational and personal network between the two groups can be generalized to the two age categories with the risk of 0.001%.

Finally, the test of scores of ranks, by adding the two measurement items of frequency of contacts, gives an average of 3461 for the age group of less than 40 years and 3698 for the other group. The result of the Kruskal-Wallis test is not significant. In fact, the probability of being wrong by rejecting the null hypothesis is 74% and as a result the two groups come from the same generation according to the contacts frequency.

To check the variability of the personal ties in each age category, we mobilized a test on the scores of ranks. The result of the latter reveals a mean of score rank score of 0.73 for the age group of less than 40 years and 0.52 for the sample of contractors of more than 40 years. The difference in test between the two samples, considering the age variable is significant with a risk of 10% (p-value= 0.0994).

The Kruskal-Wallis test is significant at the level of 10% (p-value= 0.072), and thus, the difference between the group of age less than 40 years and that more than 40 years is generalizable for our sample. Using the same test on the variability of the attributes of alters light of the items retained after factor analysis shows that there is no significant difference between attributes of alters between the two groups (with p-value= 0.28).

**Table 3: Summary of results of non-parametric tests: Nature of ties and attributes of alters**

<b>Variables : Features</b>	<b>Nature of ties****</b>	<b>Attributes of alters****</b>
Number of the items*	3	4
Scope of item	1-3	1-3
Scope of the scale**	3-9	4-912
Number of observations Age<40 years	10	10
Number of observations Age≥40 years	22	22
Sum scores Age<40 years	195	135
Sum scores Age≥40 years	333	393
Average Age<40 years***	0.7308	2.35
Average Age≥40 years***	0.5256	2.053
<b>Test of Wilcoxon (two group of age)</b>		
Statistics (S)		
Normal approximation Z*	264 2.525	264 4.977
Pr≥Z(unilatéral)	0.0994	0.000
<b>Test of Kruskal –Wallis</b>		
Chi-deux	1.988	0.224
DL	1	1
Pr≥Chi-deux	0.072	0.82

The verification of tests of hypothesis is based on explanatory methods, including simple regression. By referring to the linear fit, this method verifies the cause and effect relationships between the relational and personal network and the access to strategic resources. One of the

conditions of application of the simple regression refers to the number of observations required. To this end, we relied on the entire sample.

In order to test the relationships of variables acting on the access to strategic resources, we used multiple regression tests that are on three levels: Dependence intensity between each component of the relational and personal network (network structure- nature of the ties-attribute of alters) and access to strategic resources is calculated using the correlation coefficient, the significance of the relation and the quality of the fit of the model as assessed through the coefficient  $R^2$ , the test F of Fischer and finally a residue examination to translate the model's accuracy.

It should be noted that the linear coefficient of determination,  $R^2$  is the main indicator of the quality of regression. In other words, it summarizes the ability of the regression line to represent all of the point cloud of the observed values. This assessment should be as high as possible. However,  $R^2$  interpretation must take into account also the number of explanatory variables and observations integrated in the model. To this end, the adjusted  $R^2$  provides a more realistic assessment of the results of the model.

**Table 4: Results of the multiple regression: Structure of the network- access to strategic resources**

	Coefficient (p-value)	
	Access to resources (1)	Access to resources (2)
Size of ties	0.48*** (0.000)	0.569** (0.013)
Frequency of contacts	-0.371** ( 0.022)	-0.416 ns (0.28)
Network functionality	-0.0027ns (0.649)	0.031** (0.045)
Constant	3.902*** (0.000)	4.096 *** (0.001)
N.obs	32	32
RMSE	0.43	1.078
Parms	4	4
$R^2$	54.04%	38.67%
Value of F	10.976	5.884
p-value of F	0.0001	0.003

The first relationship we wanted to check, logically concerns the assumption about the possible influence of the structure of the relational network of the contractor on the access to strategic resources. The test of multiple regressions provided a significant result. Indeed, the F value is 10,976 with probability p-value = 0.0001 for the first regression and 5.884 with probability p-value = 0.003 for the second regression. This result allows any conclusions about the quality of the value between the two variables. At this stage, we conducted a verification of three main relationships between the network size, the frequency of contact and the network functionality.

To check the first relationship, that is to say, the effect of network size on the access to strategic resources, our resultsof estimates show a coefficient of 0.48 with a p-value = 0.000 for the relationship "network size-access to strategic resources" and a coefficient of 0.569 with p-value = 0.013 for the relationship "network size - access to strategic resources". Thus,the

## Effects of Relational and Personal Network of Tunisian Contractors

hypothesis H.1.1 postulating that access to strategic resources depends on the size of the network is accepted.

It is the same for the test of the relationship between network functionality and access to strategic resources. The result shows a significant coefficient of 0.031 (p-value=0.045) and therefore, the acceptance of the hypothesis H.1.2 proposing that network functionality apprehended on the side of the gestures and the roles of contacts significantly influences the access to strategic resources.

However, concerning the role that can play the frequency of contacts on the access to strategic resources, our results show a non-significant coefficient (p-value=0.28) and therefore, the hypothesis H.1.3 is rejected. In this sense, we can conclude that the hypothesis H1 of the relationship between relational and personal network structure and access to strategic resources is partially validated.

The second relationship we have studied is the influence of the nature of the ties on the access to strategic resources (H.1.4). The analysis of the test of the first simple regression revealed a non-significant test ( $F = 0.01$  with p-value = 0.92). In this sense, we performed an analysis based on the results provided by the non-parametric tests on changing the nature of links in the two groups of age. The test of regression is still not significant ( $F = 0.029$ , p-value = 0.074). By opposition, the test of the second regression indicates a value of  $F 3.13$  which is significant at the level of 10% (with p-value=0.086). The share of the variance returned is equal to 9.4%. Thus, we conclude a partial validation of the hypothesis H.1.4.

**Table 5: Regression of the model: Nature of the ties and access to external resources**

ANOVA								
	DF	Sum of squared	Mean square	R <sup>2</sup>	R <sup>2</sup> adjusted	Error	Value of F	p-value of F
Regression 1	1	0.633	0.373	2.9%	7.4%	11.22	0.01	0.92
Regression 2	1	1.27	1.71	9.4%	6.4%	45.22	3.13	0.086
Coefficient (p-value)								
	Access to resources (1)			Access to resources (2)				
Nature of ties	-0.027ns (0.924)			1.027* (0.087)				
Constant	4.19*** (0.000)			4.43 *** (0.001)				

In order to check the third relationship, that is to say, the effect of attributes of alters on the access to strategic resources we conducted a regression test between the two variables. The results of the latter indicates a null value of F with a probability of 96.9%.

**Table 6: Regression of the model: Attributes of alters and access to strategic resources**

ANOVA								
	DF	Sum of squared	Mean square	R <sup>2</sup>	R <sup>2</sup> adjusted	Error	Value of F	p-value of F
Regression 1	1	11.39	0.37	1.5%	5%	11.39	0.22	0.8005
Regression 2	1	1.81	0.14	0.5%	0.63%	52.81	0.08	0.925
Coefficient (p-value)								
	Access to resources (1)			Access to resources(2)				
Attributs des alters	-0.084ns (0.969)			0.179 (0.704)				
Constante	4.201*** (0.000)			4.63 *** (0.000)				

In addition, the simple regression test is significant for either the first regression ( $F = 0.22$ ,  $p\text{-value} = 0.8$ ) or for the access to strategic resources ( $F = 0.08$ ,  $p\text{-value} = 0.92$ ). This result, then allows us to conclude to the rejection of the hypothesis H.1.5.

### Concluding remarks

Our empirical analysis highlighted, although partially, the role attributed to the relational and personal network of the contractor in their access to resources. To this end, it should be noted particularly the dynamic role of the network density and the high number of structural holes in the determination of the extent of access to resources. Moreover, our empirical analysis emphasizes that this structure of the relational network differs significantly between the categories of contractors fewer than 40 and those over 40 years.

To this end, our estimation results show that the structure of relational network structure from the side of the size and functionality of the network significantly affect access to resources. Regarding the nature of the ties, it partially affects the access to resources. However, the variable frequency of contact and diversity of attributes of alters not have a significant effect on access to resources.

### Authors' Note

This manuscript is the authors' original work, has not been published and is not under consideration for publication elsewhere.

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## Effects of Relational and Personal Network of Tunisian Contractors

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