The influence of social network at the different stages of entrepreneurial firm development: analysis of GEM data in Russia

Summary

The influence of social networks on the entrepreneurship process is the subject of rather intensive research. The most scientists concentrate on the impact of social capital on entrepreneurship in comparatively narrow context. Some of them make an emphasis on certain industries (Elfrig, Hulsink, 2001; Perren, 2002; Neergand, Madsen, 2004), others – particular geographic regions (Johannisson, Monsted, 1997). During last years the interest to the role of social networks in entrepreneurial process has been growing at extremely high pace which may be illustrated not only by numerous publications in the leading papers on entrepreneurship (e.g., Witt, 2004; Lechner, Dowling, Welpe, 2006; Rogers, 2006; Klyver, Hindle, Meyer, 2008), but also the dedication of the whole section in GEM questionnaire to the questions on social network.

This theoretical issue has special meaning for Russia where so called “connections” historically played highly important role in getting access to deficit goods and administrative carrier, especially in Soviet times. After the failure of Soviet Union and transfer to the market relations the importance of personal relations did not decreased and those “connections” became important in the entrepreneurial process and new ventures development. The influence of social networks on business in Russia was studied by some Russian and foreign authors (e.g. Bashkirova, 2001; Batjargal, 2005; Rogers, 2006; Batjargal, 2006). All of them are concentrated on the impact of social networks on the creation of entrepreneurial firms but not on the further development of the latter. Nevertheless, the question of comparative importance of different type of social networks at different stages of development of entrepreneurial firms is highly relevant for proper understanding of the entrepreneurship process in Russia and other countries.

The purpose of this paper is to reveal how social networks of the founder of the entrepreneurial firm influence on the firm at different stages of its establishment and development. For this purpose a model of artificial intelligence was developed which was tested and tuned on the GEM database where Russian data are presented from 2006. It is necessary to note that GEM surveys have been used already in some research (e.g. Klyver, Hindle, 2007; Klyver, Hindle, Meyer, 2008) but these authors used econometric models which do not allow to estimate the influence of different factors on different stages of business development. In our research we used the model of neuron networks which allow
to estimate not only qualitative but also quantitative influence of different factors on the development of the firm.

**Hypotheses**

**Hypothesis 1.** The increase of number of people personally acquainted to the entrepreneur positively influences the index of entrepreneurial activity

**Hypothesis 2.** The social networks of the entrepreneur have a larger impact on the stage of the company birth and a less impact on the stage of surviving.

**Data**

Global Entrepreneurship Monitoring is the project of leading world business schools aimed at research of entrepreneurship development in different countries and exchange of vital information on entrepreneurial activity. GEM surveys provide information on crucial characteristics of potential and existing entrepreneurs typical for particular country. Also, we should note that the GEM data analysis sheds a light on the importance of entrepreneurial activity for economic development of the country.

The Graduate School of Management of SPbSU has been participating in GEM project from 2006. There are three main information sources in GEM research — Adult Population Survey (APS), National Expert Surveys (NES) and national economic and demographic statistical data.

In our research we used only the first information source – the Adult Population Survey which investigates opinions of adult population with a special questionnaire containing questions revealing respondent attitudes towards organization of entrepreneurial activity. The minimum sample for this research is 2000 people. In 2008 the database of GEM in Russia contained opinions of already more than 4000 respondents.

**Variables**

**Dependent variables.** The choice of dependent variables is based directly on the purpose of our study – they should describe entrepreneurship at different stages of business development.

1. **The birth stage.** The index of entrepreneurial activity is marked in the questionnaire as TEA. It characterizes the level of entrepreneurial activity at different stages of firm development. The share of population at the age of 18-64 being nascent

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1 See: [www.gemconsortium.org](http://www.gemconsortium.org)
entrepreneurs and owners of newly established business. If the respondent is involved in
the both types of activity his/her entrepreneurial activity is entered in the data only once.

2. The surviving stage. The variable ESTBBU represents the share of population
at the age of 18-64 being founders and managers of an established business. The company
pays the salary to such director for more than 42 months.

Independent variables. There are 6 independent variables in our model.

Engagement in social networks (KNOENT) is the main independent variable
because we want to estimate this factor influence at different stages of entrepreneurial firm
development. The KNOENT variable in questionnaire shows the share of population which
is acquainted with people started their own business during the last two years.

Readiness to use new opportunities (OPPORT). Discovering new opportunities is
the crucial feature of entrepreneurship. Entrepreneurial social network may be a factor
enhancing readiness to use new opportunities (Singh, 2000; Puhakka, 2002; Klyver,
Hindle, 2007). The OPPORT variable shows the share of population believing that next
half of a year will be favorable for starting new business.

Competency (SUSKILL). This variable checks if the respondent has some
professional knowledge and skills for starting new business. Previous research have found
evidence of interdependency of entrepreneurial process and competencies of business
founders бизнеса (Davidsson, Honig 2003; Reynolds 1997). Generally, the main purpose
of establishing and maintaining the social networks is getting the access to resources
needed by the entrepreneur (Klyver, Hindle, 2007). Therefore, the level of competency
determines what resources are needed and how the social networks may be used. The
SUSKILL variable shows the share of population believing that they have sufficient
knowledge and skills for establishing a new business.

The fear of failure (FRFAIL). The FRFAIL variable shows the share of
population which could be stopped from starting a new business by the fear of potential
failure. We think that this variable has quite important influence on the wish of the
entrepreneur to be an entrepreneur that is why we included it at a control variable.

Age. In previous research it was found that the age of entrepreneur has some
influence on the patterns in establishing and using the social networks for acquiring
necessary resources (Greve, Salaff, 2003). From one hand, the age of entrepreneur
influences on the amount and scope of available resources and, consequently, on the
resources which are needed. From the other hand, the age of entrepreneur may influence on
the content of the social network which may be dominated by the people of the same
cohort (Klyver, Hindle, 2007). In modeling different stages we will use different variables,
describing the age of entrepreneur. For example, for the first stage we will use the percentage of people involved in TEA. For the second stage — the percentage of people involved into the established business. AC1 – the percentage of people at the age of 18-34 in the general sample. AC2 – the percentage of people at the age of 35-64 in the general sample.

**Gender.** The entrepreneurship literature shows evidence of different approaches of men and women in building social networks (Weiler, Bernasek, 2001; Greve, Salaff, 2003; Neergaard et al., 2005). These differences will be checked in our research as well. The Genm variable is the share of men involved in TEA/ESTBBU in the general sample. The Genf variable is the share of women involved in TEA/ESTBBU in the general sample.

**The model**

The artificial neuron networks are becoming a rather popular instrument of analysis nowadays. Along with classification and forecasting problems the neuron networks may be effectively used for solving more complex task under the deficit of information. The deficit of information is mentioned here because at this stage of research we may operate only three sets of variables (2006–2008), though in the statistical analysis this may be insufficient to get needed validity. That is why it was decided to use the apparatus of neuron networks (NN). Essentially, the NN method uses a mathematical model built similar to human brain and in same sense imitate the working of biological neuron networks. The main advantage of NN in our case is that having only few sets of data (which will play the role of learning samples later) a wisely designed network may give us the result highly similar to reality. Mainly, it happens because the structure similar to biologic NN with numerous connections accounts for inner interdependency of variables and often underline those relationships which are overlooked by other models. In our research of different stages of business development it may be suggested that this task may be solved by well learned perceptron. It allows to build a mathematical model serving the multidimensional projection of input vector X on output vector Y. In our case the role of input vector will be played by the part of the data set gathered through interviews. But using of all variables (about 150 variables for each year) seems to be not very correct because it will cause high level of noise in the model. For the role of independent variables we choose such a group of variables which has the strongest joint influence on the estimated factor. That means that even if for the purpose of research it is important to estimate the influence of some particular variables the learning of NN is necessary to run on the entire group of factors. This is necessary for reducing possible errors in forecasting
after learning. Our hypotheses on the influence of particular factors may be confirmed or rejected which provides a universal character of developed method regardless of initial data set. So, the expert estimations are necessary for reducing the noise level in the model but in case of incorrect estimation of some factor influence NN network may minimize the dependency of this factor and the resulting variable.

The results

As the main variable describing existence of social network we use the variable describing the acquaintance of the respondent with an entrepreneur. The mathematical analysis of the data provided the test of our hypothesis about positive relationships between social networks and the level of entrepreneurial activity of the population. New we have the evidence that a higher share of population acquainted with an entrepreneur causes the higher share of population in the age of 18-64 being nascent entrepreneurs and owners of their business which is currently at the birth stage of the firm.

Our second hypothesis is also confirmed by the analysis of the data. Testing this hypothesis we used six independent variables which have, in our opinion, relation to social networks: acquaintance with an entrepreneur, readiness to use new opportunities, the fear of failure, the level of competency, the gender and the age of entrepreneur. Comparing two stages of entrepreneurial firm development – the birth stage and the surviving stage – we proved that the social networks have different influence on different stages of firm development. At the birth stage almost all variables have critical influence. At the surviving stage this influence is absent or is insignificant.

Literature


