Sapienza Universita di Roma.

Behavioural Economics and Decision Theory Application in Agricultural Entrepreneurship Promotion.

Natalia Dobryagina.

Matricola 1626160

2016

"Agricolam laudat iuris legumque peritussub galli cantum consultor ubi ostia pulsatille datis vadibus qui rure extractus in urbem estsolos felicis viventis clamat in urbe"

Quintus Horatius Flaccus

Acknowledgements.

I'm deeply grateful to my supervisor professor Claudio Sardoni for his constant support and advice.

I would like to thank professor Nuria Bosch Roca for this great opportunity to conduct my experiment in the University of Barcelona. A heartfelt thank you to professors Maria Cubel and Santiago Sanchez-Pages for their advices and expertise in experimental economics.

I'm sincerely grateful to professor Philipp Koellinger from the University of Amsterdam for his advices and inspiration and for the opportunity to participate in the "Center of Research in Experimental Economics and Political Decision Making" seminars.

And finally thanks to Ilias Pasidis, Richard Karlsson Linner, Mael Lebreton, Fleur Meddens, Joel van der Weele and Francisco de Lima Cavalcanti for the useful and motivating discussions.

Thank you !

Abstract.

The Dissertation "Behavioural Economics and Decision Theory Application in Agricultural Entrepreneurship Promotion" consists of four Papers.

Paper I "Behavioural Economics Application in Agricultural Entrepreneurship Promotion" proves the importance of entrepreneurship in agriculture promotion and demonstrates the shortcomings of the existing instruments of agro-business motivation. It also shows the limitations of existing literature on entrepreneurship and the low explanatory power of neoclassical models in entrepreneurship theory. The Paper justifies the Behavioural Economics (BE) application in agricultural entrepreneurship motivation and considers how the BE approaches can be implemented in agricultural entrepreneurship promotion. The Paper reveals negative consequences of the biased perception of the agricultural sphere and opens a discussion on possible ways of potential entrepreneurs perception biases avoidance. The Paper proves importance of diversification of hereditary and non-hereditary entrepreneurs, describes possible ways of NUDGE Theory application, stresses the importance of non-pecuniary factors in entrepreneur's decision making process and suggests indirect agro-entrepreneurship promotion methods through consumers.

Paper II "Policy Effect on Entrepreneurial Decision Modeling and Entrepreneurship Criteria Classification" main goals were to model a policy effect on entrepreneurial decision and to create a classification of entrepreneurship criteria applicable in experiment devoted to policy effectiveness assessment. The Paper divides the entrepreneurial determinants classifications into two groups, according to the perspective: Policy Maker's or Decision Maker's. The differences between two perspectives decrease the effectiveness of policies aimed at motivation of entrepreneurship in Agriculture. The Decision Maker's perspective can also be divided into Factors and Gains subgroups. The final decision is made based on the Gains consideration. Applying top-down and bottom-up approaches, using existing literature on entrepreneurship criteria and Maslow hierarchy of needs and his later works, a new classification of entrepreneurship Gains was created and consists of pecuniary and non-pecuniary factors: Realisation, Freedom, Belonging, Social Preference and Esteem.

The classification was checked by applying it to 120 reasons of choosing entrepreneurial career, described by real entrepreneurs. 116 out of 120 reasons were allocated to one of the criteria groups. Part III would apply the created classification of gains in the experiment devoted to analysis of effectiveness of non-financial approaches to Agro-sphere promotion.

The model of a Policy Effect on Entrepreneurial Decision was also created in Part II. The Policy Effect is modeled, applying Average Treatment Effect formula. The Paper suggests different approaches to outcome variable y_i depending on the Decision Maker. The hereditary farmer's decision to become entrepreneur should be modeled as a binary variable, while the non-hereditary entrepreneur's decision should be modeled as a discrete variable. According to a third approach, the outcome variable can be modeled as a continuous variable, with a value from 0 to 100, which represent the Attractiveness score of the Agricultural sphere of

entrepreneurship. The continuous variable shows a change in perception of the Agricultural sphere Attractiveness.

In the model, the continuous outcome variable is calculated as a sum of criteria performance multiplied by the criteria weight: $V_a = \sum_{j \epsilon J} w_j \, v_{a,j}$. The model, created in Part II includes the minimum level of performance of alternative on criterion: $v_{a,j} \geq m_j$, the biased perception of alternative performance $v_{a,j} \neq v^*_{a,j}$, the risks $v_{a,j} = \sum_{l=1}^{L} p_l a_{l,a,j}$ and the difference in the criteria importance among different groups of individuals $w_{e,j} \neq w_{f,j} \; \forall e \neq f$.

Paper III of the Thesis "Promotion of Entrepreneurship in Agriculture. Experiment on Non-Pecuniary Method." is based on the model of a Policy Effect on Entrepreneurial Decision and list of Entrepreneurial Decision criteria, created in the previous Part. The experiment results indicate that the non-financial approach to Agricultural entrepreneurship promotion has a significant effect on the average Attractiveness of the sphere and increases the number of interviewees, who evaluate the Agricultural sphere as the most attractive among the six suggested alternatives. The increase in the average Attractiveness score of the alternative "Agriculture" can be explained by the average increase in perceived performance of alternative on a number of criteria, what proves a stable effect of the Treatment on the Agricultural sphere perception. An assumption that the Treatment has a debiasing effect on the Agricultural sphere perception was made, based on the Paper II conclusions and assumption that perceived performance of the Agro-sphere is underestimated.

The experiment also shows that interviewees, who evaluated the Agricultural sphere as more attractive, gave lower importance to the financial criterion Income. The negative correlation between the level of Attractiveness of the Agro-sphere and Income importance as well as the absence of correlation between the sphere Attractiveness and sphere performance on financial criterion also proves that Income is less important for potential entrepreneurs in Agro-sphere than for those who are more attracted by other business spheres. The background data analyses shows that the participants from smaller cities as well as those who consume organic products find the Agricultural sphere more attractive. The regression model, based on the experiment results, shows that the classification of entrepreneurial decision criteria can be applied in the experiment and predicts the level of Attractiveness of a business sphere.

Paper IV presents a survey conducted in a form of interviews with 30 non-hereditary entrepreneurs in the sphere of Agriculture and 30 entrepreneurs from urban spheres of business. The survey provides several important conclusions and observations. Firstly, the importance of financial criteria is significantly lower for the Agricultural entrepreneurs. Secondly, Rural entrepreneurs value Freedom and Social preference (altruism, sustainability, social responsibility) more than Urban entrepreneurs. The significant correlation between Realisation and Esteem importance for entrepreneurs in Agriculture assumes a considerable social component in entrepreneurs' perception of self-realisation. Also entrepreneurs in Agriculture are more devoted to their business sphere, than urban entrepreneurs. The follow-up questions revealed that entrepreneurs in Agriculture tend to apply the satisficing rule to financial determinants. The application of satisficing approach to Income might be a factor, which significantly decreases the agricultural business development.

Content

Part I. Behavioural Economics Application in Entrepreneurship in Agriculture Promotion.

1. INTRODUCTION.

Entrepreneurship plays an important role in agriculture. It brings innovation to the economy and contributes to the rural areas development. It brings capital, networks, new skills and approaches to the agro-sphere, increases total production, improves quality and increases competitiveness. According to the recent paper by Pyysiäinen (2013), the policy implementers believe that farmers need to be activated into entrepreneurship by external interventions, performed by external agents. Entrepreneurship in agriculture receives strong financial support from international organisations. Farmers and entrepreneurs in rural areas are also motivated by improvements in legislation and infrastructure, expert advices and assistance in networks creation. European Agricultural Fund for Rural Development (EAFRD) budget is 95 billion euro allocated in grants to countries implementing their rural development programmes. The European Social Fund with a budget of €80 billion assists entrepreneurs in rural areas in establishing and growing their own businesses by improving their and their workers skills. However, the research devoted to entrepreneurship in agro-business is limited. Also, due to low attractiveness of the industry, biased perception of the agricultural sphere opportunities and lack of motivation of new entrants, the entrepreneurship in agriculture motivation programs appear scant. I assume that Behavioural Economics (BE) might provide a great contribution to the agricultural entrepreneurship promotion, providing a new cluster of agricultural entrepreneurship promotion instruments, which will demand lower financial costs than the commonly used approaches.

The goal of this paper is to consider the existing literature on entrepreneurship and Behavioural Economics, analyse the current approaches to agro-business promotion (also from the Behavioural Economics perspective) and find ways of BE implementation in agricultural entrepreneurship motivation.

2. THE THEORY OF ENTREPRENEURSHIP AND BEHAVIOURAL ECONOMICS.

The approaches to agro-entrepreneurship promotion should be based on clear understanding of the economics of entrepreneurship. This chapter presents the theoretical foundation of entrepreneurship. It also considers Behavioural Economics and explains its contribution to the theory of entrepreneurship.

2.1 Entrepreneurship and Economic Theories.

Nowadays economics of entrepreneurship is one of the quickly developing research fields, which demands new economic models and assumptions (Parker, 2009). In the neoclassical growth theory, the contribution of entrepreneurship to the economic growth was not taken into account. The classical approaches in economics include the equilibrium model with a perfect competition and zero profits, while appearance of entrepreneurship assumes the opportunities for non-zero profits and absence of equilibrium on the market. Due to this reason, entrepreneurship as an economic phenomenon was not considered in neoclassical growth models; however, the obvious contribution of entrepreneurship to the economy demanded closer consideration of the phenomenon and inclusion of entrepreneurship into growth models.

The early theories of entrepreneurship include works by Knight (1921), who stressed the importance of risk and uncertainty in entrepreneurship. Knight used the term “risk” for the so-called measurable uncertainty, in case of which the possible outcomes and their probabilities are known; “uncertainty” in this case implies that probabilities can’t be calculated. Uncertainty is considered as the key factor of entrepreneurial activity. Knight emphasises the difference between the worker’s and entrepreneur’s attitude to risk, he argues that uncertainty is the reason of profits existence (the idea that is considered as an alternative to the perfect competition model, which assumes zero profits). Uncertainty, according to Knight, appears due to individual’s partial knowledge. Knight mentions earlier works by Mithoff, according to which the entrepreneur's income consists of rents, wages, and a "profit", which might be considered as a remuneration for taking the risk of failure. Despite the fact that uncertainty, according to Knight, explains profit and loss, profit, when it occurs, is not precisely a "reward for risk-taking," however the income expectation is the incentive to consider the entrepreneurial career.

Another important contribution to the theory of entrepreneurship was made by Schumpeter (1934) who emphasised the importance of entrepreneurs as a power that brings innovation to the economy (the event that is followed by imitation process). The Schumpeter's long-cycles hypothesis determines innovation as a process, which has an initiating role. He argues that entrepreneurs initiate economic change and influence consumers' behaviour. Schumpeter also introduces a concept of a "new combination", which includes five possible cases: the introduction of a new good or a new quality of a good, introduction of a new method of production, discovering of a new market, new source of supply and carrying out of a new organisation of any industry. The new combination appears due to the entrepreneur's innovative activity, which demands necessary credit. Entrepreneurs might receive the necessary credit from banks and capitalists, due to what innovation and credit are strongly linked in the process of economic change.

Another contribution of Schumpeter includes the psychological explanation of the entrepreneur's behaviour. "First of all, there is a dream and the will to found a private kingdom ... Then there is the will to conquer: the impulse to fight, to prove oneself superior to others, to succeed for the sake of success itself (not for the fruits of success) …Finally, there is the joy of creating." Through the psychological peculiarities of entrepreneurs, Schumpeter points our attention to the non-financial motivational factors of entrepreneurship.

The theories of Knight and Schumpeter emphasise not only the relevance and importance of entrepreneurship consideration in economic theories, but also the importance of behavioural characteristics of entrepreneurs.

A significant contribution to the Theory of Entrepreneurship was made by Israel Kirzner. He also mentions the fact that neoclassical economic models sometimes have unrealistic assumptions, such as perfect knowledge. The reality though is a proof of existence of a number of undiscovered opportunities. According to Kirzner, people don't perceive all possible opportunities of mutually beneficial exchange (Kirzner, 1979). Kirzner introduces the concept of "Entrepreneurial Alertness", which implies the ability to realise the opportunities on the market, and search for the ways of implementing them in order to receive profits. The concept of Alertness assumes that there are individuals who have this ability, while the other individuals don't.

Other economic theories of entrepreneurship include consideration of entrepreneurship as an alternative to work in the Occupational Choice model. This model considers all agents as

homogeneous and according to the simplest static model if *pi* > *w* (where *pi* is profit from entrepreneurship and *w* is a wage) an individual chooses to become an entrepreneur (de Wit, 1993). More complex models include risk factor, difference in attitude to risk (Kihlstrom and Laffont (1979)) and idea of heterogeneous entrepreneurial ability (Lucas, 1978). While the difference in attitude to risk was mentioned in much earlier works by Knight, the heterogeneity of abilities adds a new perspective. The model assumes that heterogeneous abilities create heterogeneous income for entrepreneurs, while salaries of workers are assumed equal. This assumption emphasises the higher level of complexity in models, which take into account entrepreneurship.

In macroeconomic theories, entrepreneurship is considered from other perspectives. In Banerjee and Newman (1993) approach, the primary goal of entrepreneurship is to create wealth. The authors direct attention to the economic development of a country and the role of "evolution of occupational patterns". They build a model, which is focused on the interconnection between the process of development and the pattern of occupational choice. They strongly emphasise the importance of entrepreneurship in economic development of a state.

Another model proposed by Calvo and Wellisz (1980) considers technology and technological progress as a factor, which determines the occupational choice of entrepreneurs. They attract attention to the role of external factors, which form entrepreneurship.

According to Shane and Venkataraman (2000), the entrepreneurial function assumes identification, analysis and utilisation of opportunities, creation of new products, services or processes; application of new strategies and search for new markets.

2.2 Entrepreneurship in a Dynamic Perspective.

Research in the sphere of business capabilities demands differentiation between entrepreneurs, managers and capitalists; however, in some cases one individual might perform the functions of all three agents (Cuervo, 2007). The problem of agents differentiation represents a significant difficulty in entrepreneurship research.

According to the Cuervo and Ribeiro (2007) classification, entrepreneurs, capitalists and managers are diversified by their characteristics and behaviour (as can be seen from the Table 1).

Table 1. Entrepreneurs, Managers and Capitalists (Cuervo, 2007).

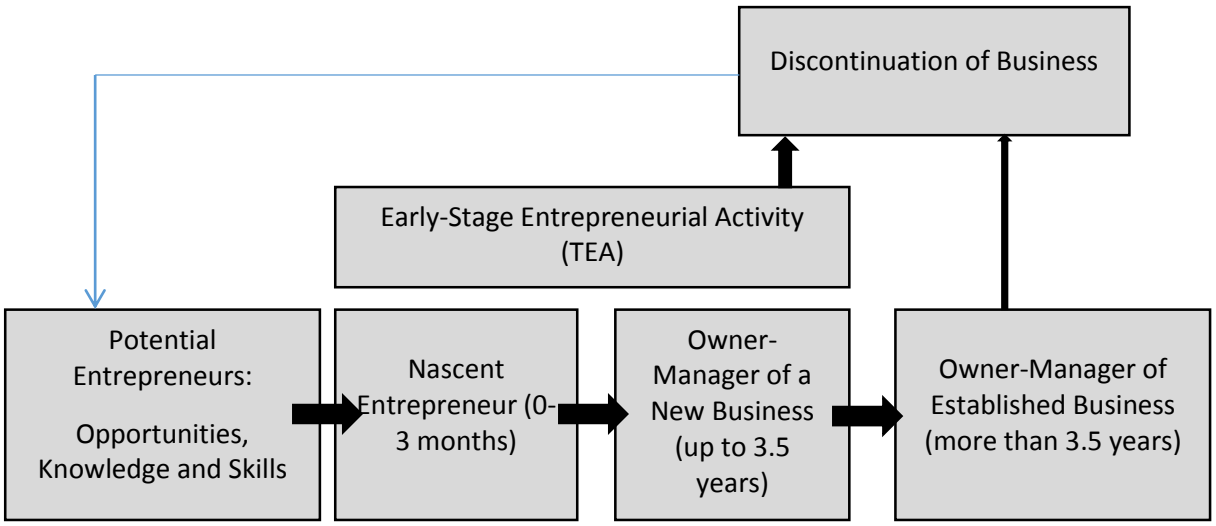
	Entrepreneur	Capitalist	Manager
Characteristics	Discovers and exploits Opportunities. A creator who initiates and motivates the process of change.	Capital owner: shareholders. Controlling shareholder. Passive shareholder.	Administrates and manages resources. An administrator.
Behaviour	Accepts risks. Uses intuition, is alert, explores new business. Leadership, initiates new ways of acting. Identifies business Opportunities. Creation of new firms.	Risk averse. Assesses alternatives. Choice of venture Assets.	Risk averse. "Rational" decision-maker. Exploits business. Creates and maintains competitive advantage. Creates trust to enhance cooperation. Supervision of the administrative process.

From the Cuervo graph, one can assume that during the period of the firm´s growth the entrepreneur might become capitalist or manager, acquiring such characteristics as risk aversion and "rational" decision making. That directs us to the idea that entrepreneurship can be considered from a dynamic perspective.

If we'll think about entrepreneurship as a possible stage, then the application of a dynamic model might be a useful instrument in the phenomenon study. Dynamic model includes time in its structure. If we consider two time periods t=0 and t=1 and two possible states: Entrepreneur – E and Capitalist – C, we can say that an individual, being entrepreneur in time period 0 might become a capitalist in time period 1, depending on the amount of capital accumulated in period 1 and other factors, which include behavioural characteristics of the individual.

Another dynamic perspective on entrepreneurship is presented by the Global Entrepreneurship Monitor (2014) (one of the world´s leading study on entrepreneurship since 1999), according to which entrepreneurship can be considered as a process which starts from opportunities and skills identification and leads the entrepreneur to the stage of owner-manager of an established business. The GEM identifies the so-called Early-Stage Entrepreneurial Activity (TEA), which represents the period between Potential Entrepreneur and Owner-Manager of established business (as it can be seen from the Scheme 1).

Scheme 1. The Entrepreneurship Process (GEM, 2014).



Despite the fact that all the phases are determined as parts of the entrepreneurship process, this research points readers' attention to the fact that entrepreneurship might be a stage in one´s career, which leads to the non-entrepreneurial activities of an individual. In case of entrepreneurs, the transition to other forms of economic activities might be relatively fast and not easy to trace. The "owner-manager of established business" phase in GEM report might lead to the loose of such entrepreneurial characteristics (mentioned by Shane and Venkataraman (2000)) as innovation, application of new strategies and creation of new products. The absence of a clear border between entrepreneurs and other economic agents creates additional complications in entrepreneurship research and analysis.

2.3 Behavioural Theory and Economic Models.

While entrepreneurship is a challenging direction of research, application of Behavioural Economics turns out to be a logical and necessary perspective to be taken into account while considering entrepreneurship as an economic process. In the previous paragraph, the Cuervo classification of entrepreneurs, capitalists and managers has presented behaviour as one of the key differences between agents.

The basic idea of Behavioural Economics is to understand the economic behaviour and its consequences (Cartwright, 2011). Dating back to 1960s Behavioural Economics "increases the explanatory power of economics through more realistic psychological foundations" (Camerer,

2004). While standard economic models are based on a strong assumption of human's rationality, Behavioural Economics points researchers' attention to psychological, emotional and social factors which influence individual's decisions.

Daniel Kahneman and Amos Tversky (1979) developed the so-called *Prospect Theory*, which explains the role of cognitive psychology in individual's decision-making process that often demonstrates deviations from the neo-classical theory assumptions. Kahneman and Tversky described the risk averse and risk seeking behaviour of individuals when the decision context includes full information about alternatives and their probabilities.

Behavioural Economics led to the appearance of the term "bounded rationality". Herbert Simon (1955) in 1978 won a Nobel Prize for his "pioneering research into the decision making process within economic organisations", in which he led the reader to the idea that homo economicus is not a good approximation of real behaviour. Simon proved that the concept of economic man should be replaced by "a kind of rational behaviour", which takes into account limited access to information, limited computational capacities of the individual and the influence of the decision making context. In his later works, Simon also mentions the influence of emotions and feelings on the individual's decisions.

Despite the fact that BE introduces a number of ideas, which contradict neoclassical model assumptions, it doesn't reject the neoclassical approaches which use utility theory and maximisation. Behavioural Economics enriches the theory adding greater predictability to the models and helping to identify better policies. The behavioural approaches are successfully applied in classical models and represent improved versions of Marshallian and Hicksian demand (Gabaiz, 2014), reference dependent utility (Cartwright, 2011), the utility of sequences (Loewenstein and Prelec, 1993), etc.

BE adds a number of concepts, which focus the researchers' attention on the reasons of limited rationality. These concepts include the *cognitive biases*, which represent propensity to think in a certain way what leads people to a systematic deviation from rational behaviour. Another important concept, introduced by BE is *heuristics*, which is a simplified approach to problem solving, which minimize the time, spent on decision making, but doesn't guarantee the optimal choice. Heuristics include intuitive guess, stereotypes, rules of thumb, which are the simplifying rules helping individuals to make decisions faster with smaller time costs, what can lead to the *status quo* bias. Status quo is a cognitive bias that leads people to overestimation of a certain alternative, which was already chosen before.

Other cognitive biases include *reference dependent utility* when people evaluate their satisfaction or happiness through comparison with other people. The so-called *framing effect* which assumes that choice of an individual or his answer to a certain question depends on the way the question was asked. The *endowment effect,* according to which when an individual is asked to choose between two alternatives which consist of two equal by price products, but the difference is that one product was already given to the individual and he is asked whether he wants to exchange it to another alternative; in a vast majority of cases the individual will choose the one he already has in his hands (List 2004). This effect can be explained through reference dependence and loss aversion. *Bounded awareness* described by M. Bazerman and D. Chugh is a process when people "routinely overlook important information during the decision-making process." (2005).

The list of cognitive biases is not limited to the examples presented above; one of the types of biases, which represent a separate group, is the *emotional bias*. The effect of emotional biases as well as cognitive biases is similar; they decrease the rationality in individual's decision making process. Despite the fact that emotions, beliefs and subjective opinions often become a reason of a decision bias, they might also represent decision criteria and important influencing factors in decision making process. Paying greater attention to the non-pecuniary factors and decision criteria, Behavioural Economics theory helps in improving predictability of new economic models.

2.4 Behavioural Economics Contribution to the Theory of Entrepreneurship.

Behavioural Economics can provide a strong contribution to the theory of entrepreneurship through explaining the deviations from the neoclassical assumptions about individual's decision making process. One of the examples of such deviations is the fact that people become entrepreneurs in spite of low risk-adjusted returns (Hamilton, 2000), in other words, in spite of the fact that the earnings from entrepreneurship where proven empirically to have low medium value with very high variance (Shane, 2009). This observation can't be described by a standard utility function, and it contradicts the fact that most people "have utility function that implies risk aversion" and have preference to less-variable pay (Asterbo, 2014). One of the explanations, which was widely considered in earlier theories, was the idea that entrepreneur is a more risk-seeking person; however, as it was clearly shown in the review of studies by Parker

(2009), there is no statistically significant difference between entrepreneurs and control group individuals in terms of risk attitude. Another recent research by Holm, Opper and Nee (2013) also doesn't identify any significant difference in attitude to risk between entrepreneurs and employees. Thomas Asterbo (2014) mentions this fact as one of the reasons why BE should be taken into account in entrepreneurship analysis. One of the inputs of Behavioural Economics to the entrepreneurs´ behaviour explanation is the identification of the *overconfidence* as one of the explaining factors of entrepreneurs' decision making process. It was proven empirically that entrepreneurs "subjectively perceive the return distribution too favourably when evaluating their own entrepreneurial project." (Cooper, Woo and Dunkelberg, 1988). A more detailed analysis was presented in a book by S. Parker (2009), which mentions the two distinct characteristics of entrepreneurial decision makers, which are *overoptimism,* meaning the overestimation of probability of success, and *overconfidence,* which is the underestimation of variation of outcomes. The overoptimism according to Moore et al. (2007) appears because of a cognitive bias due to which a person overestimates his abilities and underestimates competition.

Another important aspect of entrepreneurs' decision making is the *non-pecuniary benefits* which they gain from becoming entrepreneurs. Emphasised in early 1900s by Schumpeter, the importance of non-financial factors receive more attention nowadays, "willingness to found a private kingdom, to conquer, desire to prove superior to others as well as joy of creation" (Schumpeter, 1934) were analysed in a number of experiments in later researches. For example, Harrington (2010) in one of his articles states that entrepreneurs "don't need to be rewarded for risk as they get utility out of risk itself".

In the book by Cuervo et al (2007), Behavioural Economics contribution to the entrepreneurship theory is presented as a thorough investigation of entrepreneurial abilities, such as ability to search and gather information, to identify opportunities, to deal with risk, to establish relationships and networks, etc. Behavioural approach is contrasted to the psychological as psychological, according to the authors, considers the unchangeable personality of an individual, while behavioural approach considers skills and abilities, which can be gained.

Krueger (2000) proposed an intentions-based model, which explains the entrepreneurial behaviour, pointing attention to the cognitive peculiarities of an entrepreneur as a decision maker. He argues that on the base of robust empirical research the intentions-based model

assists in identifying cognitive infrastructures that influence the way individual perceives opportunities.

Shane, S.A. and Venkataraman, S. (2000) consider cognitive properties of different individuals which influence their ability to discover the entrepreneurial opportunities. They consider individual differences, which influence the decision to exploit an opportunity; this decision consists of weighing the value of the opportunity and comparing it to the costs of generating that value.

The research on behavioural aspects of entrepreneurship represents a promising field of study, which might find a significant practical use in entrepreneurship promotion. A focus on agriculture directs the research to the analysis of behavioural peculiarities of entrepreneurs in this sphere.

3. ENTREPRENEURSHIP IN AGRICULTURE.

Entrepreneurship in agriculture is often eliminated from the research on entrepreneurship due to difficulties in measurement and hereditary nature of agricultural business. Due to the subsidies provided to farmers, as well as state procurements, entrepreneurs in agricultural sphere are often excluded from the market processes. Also due to subsidising and governmental procurements entrepreneurs in agriculture often don´t face market competition.

The previous chapter discussed the contribution of Behavioural Economics to the Theory of Entrepreneurship, the Behavioural Economics is focused on decision making process of an individual, who considers an opportunity to become entrepreneur. However, heredity in agricultural business creates entrepreneurs who can´t be analysed from the decision making perspective as this group of agents doesn't make a decision to enter the agro-sphere, they receive farms from their parents. The focus on decision making process of potential entrepreneur leads to the idea, that one of the possible ways of diversifying agricultural entrepreneurs is to divide them into two groups: hereditary and non-hereditary. This Chapter will consider peculiarities of entrepreneurship in agriculture, it's importance and existing ways of agro-business promotion. The chapter would also start the discussion of the difference between hereditary and non-hereditary entrepreneurs, which would be followed up in the next chapter, which would consider the two groups from the Behavioural Economics perspective.

3.1 Peculiarities of Entrepreneurship in Agriculture.

The research on rural entrepreneurship is limited (Baumgartner, 2012). According to McElwee and Smith (2014) the vast majority of the literature on entrepreneurship is focused on urban entrepreneurs, providing doubts on whether rural enterprise is a distinctive category of entrepreneurship.

McElwee, Vesala and Peura (2007), considering the split entrepreneurial identity of the farmer, divide the rural entrepreneurs to portfolio farmers, which can be also called industrial pluralistic farmers and who have stronger entrepreneurial identity in contrast to conventional farmers. The authors are applying three dimensions of economic theories of entrepreneurship (which are risk-taking, growth orientation and innovativeness) to agricultural entrepreneurs. The research conducted measured the entrepreneurial identity of three groups of individuals: non-farm entrepreneurs, portfolio farmers and conventional farmers.

Another approach to rural entrepreneurs classification was suggested in McElwee and Smith 2012 paper. The framework demonstrates different types of entrepreneurial farmers based on the strategic orientation of the farm. The framework suggests farmers classification by their personal characteristics, business characteristics and business activities and processes. The paper also concludes that different strategic orientations in farming may require different skills, what attracts attention to the importance of certain skills acquisition for entrepreneurial success. Another paper, which also mark skills as determining factors of entrepreneurial success is the report by Rudmann (2008), in which the author identifies five key categories of skills which a farmer needs to succeed in business, these categories are professional skills, management skills, opportunity skills, strategic skills, co-operation/networking skills. The author claims that the concept of entrepreneurial skills has advantages compared to the concept of personality characteristics of entrepreneur.

Authors demonstrate variety of approaches to agricultural entrepreneurs classification and differentiation. The focus of this paper is identification of new approaches of agricultural entrepreneurship promotion through application of Behavioural Economics. Behavioural Economics focuses on the decision making process of an individual, who considers agricultural entrepreneurship as a decision alternative, so the agricultural entrepreneurs differentiation from the BE perspective should be based on decision making process of an individual. BE points researchers attention to two main elements of decision making process of an individual, which

are the number of alternatives and decision criteria (Keeney & Raiffa, 1976). If we consider rural entrereneurship from this perspective, the possible approach to entrepreneurs classification would be dividing them to hereditary and non-hereditary:

1. Hereditary entrepreneurs, who received the farm or business from their parents,
2. Non-hereditary entrepreneurs, who decided to enter the sphere of agriculture.

Hereditary entrepreneurs, due to the fact that they already have a farm, have considerably different decision making process in contrast to non-hereditary. Non-hereditary entrepreneurs often don't have previous experience in the agricultural sphere and choose it specifically for entrepreneurial and business objectives. In other words, the number of decision alternatives, which non-hereditary entrepreneur considered might be multiple, which means that the decision maker could choose from a list of possible careers in companies in different industries or entrepreneurial career in different businesses, including the sphere of agriculture. Decision making process of a hereditary entrepreneurs, in contrast to non-hereditary, can be presented as a binary choice model, which means that the decision maker basically has two main options: to become an entrepreneur or not. The binary nature of a hereditary farmer's choice of entrepreneurial career can be also seen from the FAO classification of farmers and entrepreneurs.

According to the Food and Agriculture Organisation of the United Nations report of 2012 on Entrepreneurship in farming, farmer-entrepreneurs see their farms as a means of earning profits. They are innovative and willing to take risks. FAO creates a classification of farmers and entrepreneurial farmers. While in the previous chapters, the transition from entrepreneur to manager or capitalist was shown as being difficult to trace, in case of agricultural entrepreneurship, the transition from a farmer to entrepreneur also demonstrates a peculiar process.

Scheme 2. FAO Classification of Farmers and Entrepreneurs.

Source: FAO.

As it can be seen, the FAO scheme considers only hereditary entrepreneurs. An important point mentioned in the report is that the farmers of the first group are often struggling with the basic survival, while turning towards the market on the second and third stages has a positive influence not only on the farmers' standard of living but also on the development of the whole rural area. From the Decision Making perspective we can also see that the farmer either stays on a certain stage or goes forward and achieves the entrepreneurial stage, what proves the idea that the decision making process of a hereditary entrepreneur can be modelled as a binary choice.

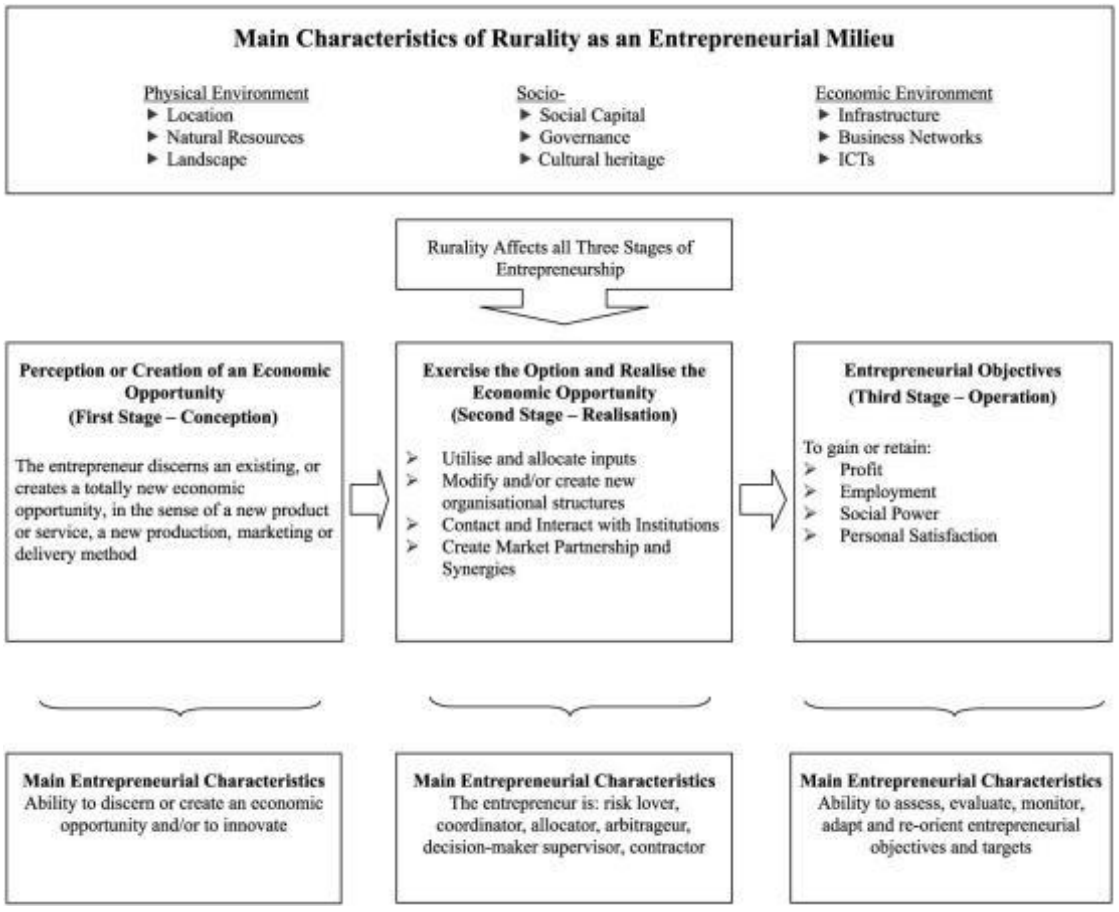
The non-hereditary entrepreneurs usually don´t have the 1st and 2nd stages. They enter the sphere of agriculture for business purposes and they might be closer to the classical understanding of entrepreneurs as, from the Behavioural Economics perspective, they make a choice, which is more related to risk-taking, growth orientation and innovativeness, which represent three dimensions of economic theories of entrepreneurship (McElwee, Vesala and Peura 2007). Also from the point of view of entrepreneurial skills, non-hereditary entrepreneurs might have significantly different level of business knowledge and education, networks and capital. Additional research is needed on the difference of hereditary and non-hereditary entrepreneurs from the entrepreneurial skills perspective.

The concept is more complex if we also consider landowners who own land and rent it, what makes them similar to industrial capitalists. In addition, the Eip-Agri report (Sutherland, 2015)

identifies three possible routes into farming: inheritance, early retirement and ex novo (individuals with no prior experience of agriculture), adding early retirement as a separate group. In this paper, I'll consider only hereditary and non-hereditary entrepreneurs as two different groups.

Considering the peculiar aspects of agricultural entrepreneurship, some researchers emphasise the importance of the rural conditions and attributes. Baumgartner et al (2012) mentions distances to sales and dense social networks of mutual control as factors, which influence the entrepreneurial process and entrepreneurial activities environment. Stathopoulou et al. (2010) discusses the specific entrepreneurial milieu in case of rural entrepreneurship, which includes physical environment, social characteristics and economic environment. They claim that these three groups of factors influence three stages of entrepreneurship, which include perception of the economic opportunity, realisation and operation, as can be seen from the Scheme 3.

Scheme 3. Characteristics of Rurality, Which Influence Entrepreneurship.



Source: Stathopoulou et al. (2010)

Stathopoulou et al. created a scheme, applicable in agricultural entrepreneurship analysis, with a focus on rural environment as a key influencing factor.

The importance of the context in entrepreneurship research was also emphasised in Welters paper on contextualizing entrepreneurship (2011). The context, according to the author provides both entrepreneurial opportunities and boundaries for actions. The author also emphasises the importance of family and household context, what definitely plays a significant role for the rural entrepreneurs due to the existence of family farm business and the fact that in EU 85% of farms are family owned (Davidova & Thomson, 2014).

The specific characteristics of agricultural entrepreneurship are not limited to possible hereditary nature, rural milieu and other context factors. McElwee (2006) mentions limited business networks and absence of systematical engagement in professional development, as factors, which distinguish agricultural entrepreneurs. The author claims that the skills gap has a negative influence on agricultural entrepreneurship development. He also assumes that marketing, financial and business planning skills should be promoted among entrepreneurial farmers.

A number of researches was devoted to the comparison of rural and urban entrepreneurship. Nielsen and Freire-Gibb (2010) studied rural and urban entrepreneurship in Denmark and concluded that urban entrepreneurs are more creative, less motivated by the financial factors and more motivated by the career factors. In this research, a certain attention is paid to the behavioural characteristics of entrepreneurs in rural and urban areas.

Faggio and Silva (2014) in their research in the UK have shown a significant positive correlation between the self-employment and innovation in urban areas and an absence of such correlation in rural areas. However, this result, as we can note from the previous paragraphs, might be partly explained by the hereditary nature of entrepreneurship in agriculture.

The rural entrepreneurs can be also divided to a number of subgroups, according to the territorial context.

One of the approach of dividing the rural entrepreneurship, based on territorial context, is dividing the area to lowland and mountainous area. According to the EU external studies, “Labelling of agricultural and food products of mountain farming” mountain area always have less production options than the coterminous lowland areas. Mountain agriculture faces limitations, connected with the natural handicaps and the investments do not always solve the existing difficulties.

Another approach of dividing rural entrepreneurship based on the territorial context is presented in the OECD report on the New Rural Paradigm (2006). The report explains the heterogeneity of rural areas, mentions the distinct characteristics of rural areas such as whether the region is leading or lagging, relying on agriculture or on tourism, peri-urban or remote.

The peri-urban territorial context means the area surrounding urban centers and significantly influenced by the city. The population density as well as population size though is not determined in existing literature (Laquinta & Drescher).

The rural marginal areas demonstrate remote countryside areas with population decline (Brezzi & Piacentini, 2010).

According to the OECD rural typology, there are four main subgroups: dynamic remote rural regions, lagging remore rural regions, dynamic intermediate regions and lagging intermediate regions.

The context related to the territorial factor influences the types of rural businesses and the approaches needed for the agricultural entrepreneurship promotion (OECD Rural Policy Review 2006).

Regardless of the type of rural area, the importance of rural entrepreneurship is high, what is proven by a number of EU projects and reports devoted to analysis of agricultural entrepreneurship positive impact on rural areas.

3.2 The Importance of Entrepreneurship in Agriculture.

Entrepreneurship in agriculture represents an important direction of research and governmental funding. The promotion of entrepreneurship in farming and agriculture is discussed in a number of UN and EU reports.

As it was stated in the Eurostat Report 2012 (“Entrepreneurship determinants: culture and capabilities”) “entrepreneurs are important drivers of economic growth, employment, innovation and productivity”. The report states some of the key reasons of importance of the agro-entrepreneurship promotion: the positive influence of entrepreneurship on the rural areas development, higher level of life in rural areas, improvement of the balance between urban and rural level of development and sustainability.

According to the 2012 FAO Report on “Promoting farmer entrepreneurship through producer organisations in Central and Eastern Europe”, one of the key components of the FAO’s rural development strategy is “building and strengthening the organisational and

business capacities of small farmer/rural producer organisations". The FAO report (2012) calls entrepreneurship "a key factor for the survival of small scale farming".

The importance of promotion of entrepreneurship in the sphere of farming is strongly emphasised not only in the UN and FAO reports and projects, but also in the EU initiatives and fund plans and in governmental priority plans.

In the European Commission funded Report on "Exploring the Significance of Entrepreneurship in Agriculture" (2007) entrepreneurship in agriculture is called an important condition for the development of sustainable countryside. The concept of sustainability in the sphere of agriculture assumes production of healthy and ecological products without causing harm to the environment.

According to the Common Agricultural Policy (CAP) of the European Union, entrepreneurship strongly improves the economic performance of the EU rural regions (Clark, 2009). The Keynote paper presented at the Seventh FAO International Rural Development Summer School begins with a statement that "Rural development is more than ever before linked to entrepreneurship".

The importance and positive influence of the rural entrepreneurship is identified in a number of recent country-based articles. In Baumgartner et al (2012) the empirical research results suggest that entrepreneurship generally has the expected positive influence on local economic performance in the case of Swiss rural areas. The correlation between development of entrepreneurship in the rural area and sustainability was also identified in a granted research in Mexico "Entrepreneurial Organisation in Irrigation Units" in which it was clearly shown that the sustainable development of the agricultural land demands the promotion of entrepreneurial competencies among farmers (Díaz-Pichardo, 2012).

Entrepreneurship brings investments, innovation, higher product competitiveness and infrastructure development to the rural areas. Its promotion is sponsored by a number of UN and EU funds and projects. The promotional approaches vary and represent different groups of instruments, which will be discussed in the next chapter.

The ideas discussed in this paragraph might appear contrary to the research mentioned in the paragraph on Peculiarities of Entrepreneurship in Agriculture. However, the key differences in conclusions are connected with the fact that in most of the existing reports and projects there is no diversification between hereditary entrepreneurship (which mostly lacks innovation, new technologies application, etc.) and non-hereditary entrepreneurship (which brings innovation,

networks and capital to the rural sphere). This important aspect in agricultural entrepreneurship research will be further discussed in Chapter 4 of the Paper.

3.3 Agricultural Entrepreneurship Promotion: Existing Methods.

As it was shown in the previous chapter, entrepreneurship plays an important role in agriculture and should be promoted. The instruments of promotion represent an open topic. As it was shown in one of the recent papers by Pyysiäinen (2013) the policy implementers believe that farmers need to be activated into entrepreneurship by external interventions, performed by external agents.

European Agricultural Fund for Rural Development (EAFRD) budget is 95 billion euro allocated in grants to countries implementing their rural development programmes. According to the EU Strategic Guidelines for 2007-2013 (European Commission website) the EU Member States were supposed to develop their national rural development strategies, which were co-financed by the EAFRD. According to the Axis 1,2,3 and 4 of the EU Rural Development Programmes 2007-2013 (RDP) the budget was dedicated to multi-functional support of the rural areas. During the six year program 1,888,613 agricultural holdings with handicaps received financial support. RDP also promoted environmentally friendly farms through the Agri-environment payments (Measure 214 of the RDP). The quality of life improvement in rural areas was another contribution of the RDP. It included rural infrastructure building that created access to the farm lands as well as energy supply and water management (37,733 was the number of operations supported by the EU). RDP also supported 43,515 investments in energy, social, environmental and ICT infrastructures, training, childcare and mobility. (Axis 3 of RDP 2007-2013). RDP supports and co-finance investments in technical modernisation as well as investments devotes to increase in efficiency of the processing, Axis 1 states 20,070 such enterprises supported by the RDP. 126,156 young farmers received financial support, 36,059 new micro-enterprises were supported or created.

Vocational trainings, educational programs as well as expert advises represent another way of agricultural entrepreneurship enforcement. Axis 1 declares 3,637,475 participants of the training programmes.

RDP activities are further extended to agricultural entrepreneurship diversification into non-agricultural activities as well as encouragement of tourism activities in rural areas (15,039 new tourism activities supported).

The LEADER EU project is an integral part of the EU Rural Development Plan, which involves local representatives of the community in rural development strategy planning, so the local actors are involved in decision-making process of the so-called Local Action Group (LAG). According to the overview of the EU LEADER programme effects (Perez, 2000) it has a number of positive effects which include development of democratic and co-operative cultures, which "create an environment for rural entrepreneurs".

The European Social Fund with a budget of €80 billion assists entrepreneurs in rural areas in establishing and growing their own businesses by improving their and their workers skills.

The new Common Agricultural Policy 2014-2020 continues the previous reform path, moving from product to producer support, according to the Agricultural Policy Perspectives Brief (N5 from 2013). The new CAP is expected to provide support in addressing such current challenges as economic, environmental and territorial. Current economic challenges include pressures on production costs due to high input prices, food security and globalization; environmental challenges are connected with principles of sustainability in production and resources use; territorial challenges can be described as demographic and social factors.

The CAP was divided into two 'Pillars': first pillar represents production support in form of direct payments and market-related expenditure, while second pillar is focused on Rural Development. The 2014-2020 CAP maintains the two pillars, but improves the interconnection between them creating a more integrated approach to policy support (Massot, 2016). In contrast to the previous period, the amount for 2014-2020 first pillar was cut by 1.8% and for the second pillar by 7.6% (in 2011 prices).

The 2014-2020 CAP has a number of new features. One of these features is rewarding farmers for the services they deliver to the wider public, such as landscapes, farmland biodiversity and climate stability (Agricultural Policy Perspectives Brief, 2013), what creates a new instrument of the first pillar, which is focused on provision of environmental public goods.

The 2014-2020 CAP first pillar consists of direct payments to farmers, as it was mentioned earlier, and common organisation of the markets, which provides the framework for the market support schemes (Ragonnaud, 2016). The direct payments to farmers key elements include

basic payment scheme, schemes for the redistribution of basic payments, young farmers schemes, greening (payments for climate- and environment-friendly practices), additional payments for the areas with natural constraints and stricter rules for the farmers, for whom agricultural activity is not the central one (Massot, 2016).

The priorities of the 2014-2020 CAP second pillar are: to support innovation in agriculture, improve the competitiveness of all types of agriculture (the instruments applied include start-up aid for young farmers, restructuring and modernisation measures), support the creation of the food production chain and risk management in farming; enforce agricultural and forest ecosystems; promote the sustainable use of resources and assist in conversion to renewable energy, to reduce poverty through job creation and providing sufficient access to information (Ragonnaud, 2016).

The European Innovation Partnership "Agricultural Productivity and Sustainability", which was launched in 2012 to contribute to the European Union's strategy 'Europe 2020', provides funds for innovative projects in agriculture. It offers financial support for projects which are focused on improving competitiveness of farmers, protecting the environment and improving the quality of life and diversification of the rural economy (Eip-agri website). EU Eip-Agri program allocates funds, provides effective platform for partnership, projects and ideas sharing among farmers.

Establishment of the specialised food networks is another approach used by the EU member states in order to promote entrepreneurship in agriculture. T. Marsden and E. Smith in one of the articles show several examples of these networks. One of them is the Graig Farm network in the UK. The network includes experts, producers and other members, it operates through group meetings, farm visits and other activities which goal is to identify the optimal strategy. The network helps farmers to specialise in a certain sphere, through ensuring effective system of distribution, which includes farm shops, mail order retailing and supermarket chains. High standards established and guaranteed by the network, instant feedback of quality issues to farmers as well as absence of external middle-men between producers and consumers makes the Graig farm network a highly competitive market player.

EU Member states constantly finance research devoted to identification of optimal strategies of rural areas development. In 2008 Switzerland has introduced a New Regional Policy (NRP) to support regional value-added creation more effectively. The NRP project in Switzerland was initiated in order to „identify the specific attributes and forms of Entrepreneurship in rural

Switzerland" and to test correlation of entrepreneurship and development of the rural regions in Switzerland.

In Italy entrepreneurship in agriculture is facilitated through programs, such as "educational fostering of the supply of initiators of business ventures", encouragement of entrepreneurial orientations, raising of awareness and attraction around business opportunities, introducing important legal innovations (Huylenbroeck & Durand, 2003).

The EU member states often fund consultancy support for agricultural entrepreneurs and farmers, for example, the Farming Advice Service financed by the Department of Environment, Food and Rural Affairs in the UK assists local farmers.

Support of the local initiatives in regional brand building, which are focused on a more intense communication of quality of the local products, is another instrument applied on the EU member states level (Marsden and Smith, 2005).

The agricultural sector in developed countries face both pressures and opportunities and agricultural business diversification (which assumes adding new business activities to traditional farming) demonstrates one of the important directions of agricultural entrepreneurship development. According to the research, made by Jostein and McElwee (2011) farmers need support in diversifying, which assumes development of their entrepreneurial skills.

FAO activities of agricultural entrepreneurship promotion are more focused on Central and Eastern European countries and include a number of projects. In a report on promotion of farmer entrepreneurship in CEE in 2006 P. Koohafkan lists a number of initiatives in Serbia, Moldova, Bulgaria and Albania. These initiatives include training programs for farmers and assistance in cooperation, which goal is to organise more effective and standardised production process, common recognisable brand and logo and systems of distribution. This FAO report mentions an important instrument in rural areas development, which is "placing an element of local identity at the core of territorial strategy". This instrument assumes that a group of local producers unites on the base of the region, raising up some traditional recipes, technologies or products in order to form a strong and unique identity, to build a recognisable brand and logo and to use more effective methods in marketing and promotion. The report mentions several successful examples of this approach, which are Antico Frigano area in Italy, the Pays Cathare in France, the Terras do Cante in Portugal and the RaJupuSu in Finland.

This chapter clearly shows diverse activities of the International Organisations in promotion of agricultural entrepreneurship through infrastructure improvements, funding of innovative, sustainable projects, providing consulting services, supporting young farmers and entrepreneurs, assisting in creation of networks and partnerships, improving legislation, involving local farmers into the strategy formation process as well as building a region-based strong identity. All these activities promote entrepreneurship in agriculture and enhance rural areas development.

However as the research on agricultural entrepreneurship is limited, the instruments used in agri-business motivation do not demonstrate the full spectrum of all possible methods of promotion. Also, the absence of diversification of hereditary and non-hereditary entrepreneurship promotion methods narrows the effectiveness of the existing strategy. I believe that application of Behavioural Economics will assist in creation of new cost-effective approaches to agricultural entrepreneurship promotion.

4. BEHAVIOURAL ECONOMICS APPLICATION IN AGRICULTURAL ENTREPRENEURSHIP PROMOTION.

As it was previously mentioned, BE provides significant contribution to the Theory of Entrepreneurship. It explains the individual's motivation, pointing attention to the non-pecuniary benefits of entrepreneurship, biased assessment of opportunities and assets as well as overoptimism and overconfidence. The importance of entrepreneurship in agriculture was clearly demonstrated in this paper as well as the existing approaches to agri-business promotion, applied on international and governmental levels. Most of the approaches include utilisation of financial instruments, while BE can suggest tools for agri-business promotion which don't demand considerable financial expenses. The BE tools influence individual's decision making process and can be successfully applied in agricultural entrepreneurship promotion. The first part of this chapter will demonstrate importance of diversification of entrepreneurs into two groups (hereditary and non-hereditary). The second part will discuss the biased perception of the agricultural sphere and its consequences. The third part will consider the Nudge Theory (which assumes that individual´s decisions might be influenced, applying behavioural decision-making approaches) and its possible application in agri-business promotion. The fourth part

will describe the opportunities of agricultural entrepreneurship promotion through consumers. The last part will open the topic of non-pecuniary factors, which determine the decision of an individual to become entrepreneur.

4.1 Hereditary and Non-hereditary Entrepreneurship Promotion.

The Behavioural Economics perspective demands better analysis of the psychological, emotional, social and cognitive factors, which influence the decision making process of an individual.

The previous Chapter divided entrepreneurs in the sphere of Agriculture to hereditary and non-hereditary, applying the BE approaches. The diversification of entrepreneurship was based on differences in decision making process of these two groups, more specifically, different number of decision alternatives and criteria. According to the BE, hereditary and non-hereditary agricultural entrepreneurs demand different motivational tools. These two groups of individuals have different cognitive and social characteristics and apply different decision making strategies. Understanding the behavioural differences of these groups is vital in agricultural entrepreneurship promotion planning.

Most of the existing research is devoted to hereditary entrepreneurship. According to the literature, hereditary entrepreneurship in agriculture can be considered as less innovative (Faggio and Silva, 2014) and less creative, motivated more by financial factors (Nielsen and Freire-Gibb, 2010), with limited business network and absence of systematical engagement in professional development (McElwee, 2006), lacking constant skills improvement and with dense social networks of mutual control (Baumgartner, 2012).

Non-hereditary entrepreneurs, in contrast to hereditary, enter the sphere of agriculture for business purposes, they didn´t inherit farms from their parents, the sphere of agriculture is their own choice. According to existing literature, non-hereditary entrepreneurs can be considered as more innovative, creative and effective. According to Madureira et al. (2015) new entrants in Portugal, Bulgaria and the UK had higher educational achievements than the average farmers. Sutherland (2015) proves that new entrants introduce innovation into the sphere and enable a more innovative agricultural sector. He also points out that new entrants utilise new types of strategies and contemporary approaches, such as organic agriculture, alternative agri-food networks, local certification schemes, engagement in different marketing channels such as

direct marketing, box schemes, etc. The main conclusion, according to Sutherland, is that new entrants bring to the agricultural sector new skills, networks and financial capital what leads to innovations in production, marketing and management. The new entrants' characteristics point greater attention to the importance of non-hereditary agricultural entrepreneurs promotion. I took the list of International Organisations' activities aimed at promotion of entrepreneurship in agriculture (discussed in the previous chapter) and divided it into two groups: actions, which influence hereditary entrepreneurs, and actions, which influence the new entrants.

Table 2. Hereditary and Non-hereditary Entrepreneurship Promotion.

International Organisations' activities aimed at promotion of hereditary and non-hereditary entrepreneurship in agriculture (based on activities of International Organisations, listed in previous chapter).

Hereditary entrepreneurship promotion	**Non-hereditary entrepreneurship promotion.**
Financial support to farms with handicaps.	Rural infrastructure building.
Rural infrastructure building.	Investments in energy, social, environmental and ICT infrastructures.
Investments in energy, social, environmental and ICT infrastructures.	Co-financing of investments in technical modernisation.
Training, childcare and mobility.	Financial support to 126,156 young farmers, 36,059 new micro-enterprises were supported or created.
Co-financing of investments in technical modernisation.	Funds for innovative projects in agriculture.
Financial support to 126,156 young farmers, 36,059 new micro-enterprises were supported or created.	Finance research devoted to identification of optimal strategies of rural areas development.
Vocational trainings, educational programs, expert advises.	"Educational fostering of the supply of initiators of business ventures" (Italy)
Agricultural entrepreneurs diversification into non-agricultural activities.	
Encouragement of tourism activities.	

Involvement local representatives of the community in situation analysis and rural development strategy planning.	
Improving skills of entrepreneurs and their workers.	
Funds for innovative projects in agriculture.	
Establishment of the specialised food networks.	
Finance research devoted to identification of optimal strategies of rural areas development.	
"Educational fostering of the supply of initiators of business ventures" (Italy)	
Consultancy support.	
Support of the local initiatives in regional brand-building.	
Include training programs for farmers and assistance in cooperation organisation.	
"Placing an element of local identity at the core of territorial strategy" (FAO).	

As it can be seen, International Organisations' activities are mostly focused on hereditary entrepreneurship promotion. However, according to the existing research, non-hereditary entrepreneurship might play a greater role in capital accumulation, innovations introduction, skills improvement and equipment modernisation. The importance of new entrants motivation can be explained by the low agricultural sphere attractiveness, as it isn´t viewed as an attractive alternative to other work sectors such as manufacturing, private, and public sector employment (Sulaiman, 2013).

BE as a scientific sphere can provide a strong contribution to motivation of non-hereditary entrepreneurs or new entrants in the sphere of agriculture, by introducing non-financial instruments of promotion and focusing on the reasons of low attractiveness of the industry for young professionals.

4.2 Entrepreneurship in Agriculture Biased Perception.

Dividing entrepreneurs in agriculture into different groups and creating agricultural entrepreneurs classifications might be an important and sofisticated research direction, which demands to take into account current trends in agricultural economics, such as the transition from the productivist to multifunctional paradigm (Huylenbroeck and Durand, 2003), which would be considered in more detail further in this chapter. Also the hereditary entrepreneurship in agriculture is often related to family farm business which "stresses the continuity of the farm through inter-generational succession." (Davidova and Tomson, 2014).

However, in terms of the Behavioral Economics application, the approach, suggested in the previous chapter, which divides agricultural entrepreneurs into hereditary and non-hereditary demonstrates an important contribution to the development of methods of agricultural entrepreneurship promotion, due to the existence of the so-called biased perception of the agricultural sphere by non-hereditary entrepreneurs.

So the previous chapter divided the entrepreneurship in agriculture into hereditary and non-hereditary. According to the FAO classification of farmers and entrepreneurs (mentioned in Chapter 3.1), the hereditary farmer might either become an entrepreneur or not become entrepreneur (in other words, the farmer's decision process can be presented as a binary choice model), while the non-hereditary entrepreneur has a greater number of career options, including a career in a company in any industry or sector and entrepreneurial career in different business spheres which might include agriculture. Due to a greater number of career options and possible absence of previous experience in the agro sphere, the perception of the agricultural business by non-hereditary entrepreneurs is often biased. In other words, the non-hereditary entrepreneurs' perception of the agricultural sphere of entrepreneurship might be limited, simplified and incorrect.

The biased perception of the agricultural sphere by the potential non-hereditary entrepreneurs might be a serious problem in promotion of entrepreneurship in agriculture.

Behavioural Economics is strongly focused on analysis of cognitive biases and heuristics which cause deviations from objective perception of decision alternatives. The fact that the perception of the agricultural sphere of business is biased is shown in a number of articles. "Ask anyone for their impression of a British farmer and they are likely to describe an aged character

with a flat cap and a tweed jacket... It's not, however, an image that will inspire the brightest and best young people to take up a career in agriculture. Nor is it accurate." (Fursdon, 2013).

The agro-sphere isn´t viewed as an attractive alternative to other work sectors such as manufacturing, private, and public sector employment (Sulaiman, 2013).

The perception of agricultural career doesn't correlate with high income, innovation, fashion, new technologies and creativity. From the Behavioural Economics perception, it can be partly explained by the status quo bias. In contrast to some other business spheres, such as Technology, for example (which from its appearance was considered as modern and innovative), agricultural sphere exists for thousands of years and only recently it acquired characteristics of a modern and promising sphere. However, lack of knowledge and tendency to perceive the industry as it used to be in the past (status quo bias), creates this false perception of the industry opportunities. Decision makers become victims of such heuristics as intuitive guess and stereotypes. Agriculture's lack of appeal in developing countries, according to Duncan Green, is also connected with social change resulting from growth in mass education, which causes a perceived decline in the status of agriculture. (Green, 2014).

To sum up, the biased perception of the agricultural sphere assumes that the agro-business is: non-innovative, not creative, not profitable, is limited in opportunities and not prestigious.

In order to show that this list of agro-sphere characteristics demonstrate a biased perception of the industry, I'll provide examples, which prove the opposite on all five characteristics.

The Agricultural sphere is *innovative*. The new, state-of-the-art technologies are often used in the agricultural business. In Uganda, a young team with the World Bank and UNICEF used a mobile app called "U-Report" to help 190,000 farmers save the harvest from a disease (Shuai Liu, 2014). Driving machines fitted with GPS mapping technology are used to limit waste fertiliser, new computer programmes are used in analyses of feed-conversion ratios for dairy cows that self-milk at machines. (Fursdon, 2013).

The Agricultural sphere is *creative*. The "Surprised Farmer" program in Japan motivates innovative ideas in agricultural products production. Its participants show a great variety of examples of creative concepts and ideas in agri-food production, examples are presented on Picture 1.

Picture 1. "Surprised Farmer" in Japan.

The Agricultural sphere is *profitable.* The highly profitable spheres of Agriculture include flowers and dried flowers production, mushroom farming and many other businesses. For example, the snails market is booming in the UK and the snails producers can't cope with the high demand (Milmo, 2014). Also the bio and organic products production opens a new page in agricultural business.

The agricultural sphere is *not limited in opportunities*. Agro-tourism adds a new cluster of business opportunities in rural areas. The agro-tourism demonstrate a growing trend in the UK (Francis, 2008), (Stroud, 2011). The currently increasing number of opportunities in agro-sphere is related to the concept of multifunctionality, which emphasises that agricultural business can provide benefits beyond food, such as touristic attraction (Huylenbroeck & Durand, 2003), the maintenance and protection of cultural heritage, etc.

The Agricultural sphere also *can't be considered as non-prestigious,* because a great number of celebrities such as Sting, Antonio Banderas and even the Royal Family Member HRH Charles the Prince of Wales are involved in agricultural products production. Rocker Sting and his wife, are planning to export the olive oil and honey they produce to America, according to a recent article in "Food and Wine" Journal. Antonio Banderas has established his winery Anta Banderas in 1999 and still successfully producers Ribera and Rueda wines. HRH Charles, the Prince of Wales owns a Duchy Originals brand of organic food production. The Agricultural business can't be called non prestigious if celebrities and royal family member are involved in the business.

As it was already mentioned, lack of knowledge and biased perception of the agricultural sphere real opportunities and characteristics limits the number of new entrants or non-hereditary entrepreneurs and decreases the effectiveness of the agricultural entrepreneurship promotion

methods. In this case, informing the potential entrepreneurs about the real opportunities and unbiased characteristics of the agricultural business might be considered as an agricultural entrepreneurship promotion method. The Part III of the Thesis would simulate such an approach, which assumes informing the experiment participants about some of the agricultural business sphere characteristics.

The next chapter will consider a cluster of behavioral decision theory methods, the Nudge Theory, and develop possible approaches of its application in agricultural entrepreneurship promotion.

4.3 Nudge Theory in Agricultural Entrepreneurship Promotion.

Nudge Theory is a concept in Behavioural Economics; it represents a number of instruments, which assist in changing people´s behaviour without direct enforcement. The approach includes the use of five groups of instruments: Incentives, Understanding preferences (Mapping), Defaults, Feedback, Error expectation and Structuring complex choices. Nudges are applied in biases avoidance and in helping make an optimal choice. Nudges can be used as instruments in agricultural entrepreneurship promotion.

(Financial) Incentives are "financial losses or gains which seek to influence decisions" (R. Thaler, C.Sunstein, 2009). Default means that certain option is preselected and a person making choice should opt-out if he doesn't like the option. According to E.J Johnson defaults are effortless, "save time", "often represent the existing state or status quo, and change usually involves a trade-off" (Johnson, E. J. & Goldstein, D. G. 2003). Understanding preferences helps people to avoid different biases and better understand their real needs. The nudge is used in order to avoid influence of the context (the way the alternatives are presented, the alternatives themselves, individual´s current state that influences the perception of his/her behaviour in a different state). Structuring complex choices nudge is used in case of overloading by information, when the human's memory, analytical and other abilities show their limits. The number of alternatives might become too great as well as the number of their characteristics, comparison of which might also become too complicated. In this case, "structure complex choices" nudge might be applied in order to assist in building a clear understandable model or scheme for a better decision. Give feedback nudge implies giving feedback on a certain choice with an opportunity to correct it. Expecting error is a nudge, which helps to avoid predictable and common mistakes.

The nudges application depends on the decision making context. Several factors, which determine the context, are: maximisation or satisfaction choice model, short or long term decision and single or repeated decision.

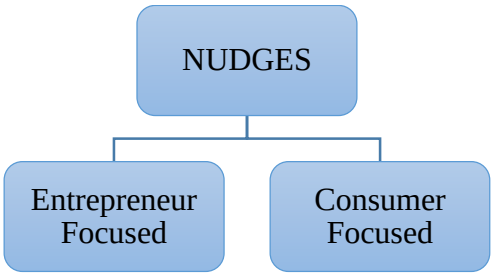
Decisions can be divided into two types according to the goal, which can be to maximise (maximise gains, utility, profits, consumption, etc.) or to achieve a certain satisfactory level. The decision to become entrepreneur might have a goal of maximization (of profits and non-financial benefits) or satisfaction. The maximisation or satisfaction approach determines the decision making strategy. If the goal of the decision maker is to maximise the profits, he/she will choose the alternative, which, according to his/her perception, can provide the highest level of profit. If the profit should achieve a certain level of satisfaction, an individual might have other criteria, which should be maximised, such as non-financial self-actualisation, freedom, etc.

Every decision also has a short or long-term perspective. The career choice has a long term perspective what reduces the decision making context to long-term decisions.

Another approach to decisions classification determines decisions as single or repeated. In case of a career choice the decision is mostly single.

Each of the nudge approaches can be considered from the entrepreneurship in agriculture promotion perspective and the peculiar aspect is that the nudges can be used in order to influence the potential entrepreneurs directly or indirectly. In case of direct influence the nudge would be focused on the entrepreneur, while in case of indirect influence, the nudge would influence the consumer of products, which the entrepreneur in the sphere of agriculture produces.

Table 3. NUDGES Focused on Entrepreneur or Consumer.



The increase in consumption and popularity of locally produced food increases the production volumes and profits of entrepreneurs in the sphere. The next paragraph would consider possible ways of nudges application.

The financial *Incentives* are often used in case of decisions with long-term benefits and short-term costs, which means that costs, choice and its consequences are separated in time, due to what decision makers face difficulties in choosing minimisation of the consumption now to receive certain benefits in long-term perspective. Incentives can be used to change people's behaviour by providing short term benefits, which motivate them to stick to better or healthier behaviour (in case of health related decisions that might be healthy diet, non-smoking, limited alcohol consumption, etc.). Incentives can be positive (payments for healthy behaviour) or negative (taxes or fees for unhealthy behaviour).

Incentives work when they are valuable for the person ("The authors did note a weak trend in favor of incentives being more effective when they comprised more than 1.2% of individuals' incomes" (Marteau, T. M. 2009.) and when the reward or punishment appears immediately (Volpp, K. G. 2008).

The effectiveness of incentives depends on the decision making context and the sphere of decision. In case of entrepreneurship in agriculture promotion, Incentives can be applied directly to entrepreneurs, providing financial incentives in different forms: subsidies, financing of certificates acquisition, etc. The application of financial incentives is one of the most common practices in agricultural entrepreneurship promotion, used in Common Agricultural Policies of the EU countries. In the recent The Telegraph article (Gosden, 2016) the current situation of the UK farmers is discussed: farmers in the UK demand subsidies which would replace the EU's Common Agricultural Policy, which currently provides 55% of their income. However, there are different points of view on the subsidies for farmers, discussed in popular media sources. For example, in articles published in the Economist and The Guardian the subsidies to farmers are called "the most blatant transfer of money to the rich" (Monbiot, 2013) and "Milking taxpayers" (Coburn, 2015).

Incentives can also target consumers, providing indirect motivation of entrepreneurship in agriculture through increase in demand and consumption. The locally produced agricultural products can be promoted through negative financial incentives by putting extra fee on agricultural products not locally produced or by positive financial incentives in a form of financial compensation, bonuses or lotteries. One of the examples of application of financial incentive on consumers was $1,000 lottery, offered by the Louisville Independent Business Alliance to consumers for participating in "buy local" program. However, the practice of promotion of local products with the use of incentives is scarce.

The influence and use of another nudge, *Defaults* is growing, what can be explained by the overloading by information. The term infobesity, which describes the information overload,

appeared in 1970s and represents a problem, which is considered in a great number of articles and researches (Rogers, 2013, Hemp, 2009). Defaults help to reduce time, spent on decision making process and not to consider big volumes of unneeded information. Defaults can be used when the choice for the decision maker is not of a great importance and he trusts the government, company or organisation to make a choice instead of him/her. One of the most common examples of defaults is the computer software default options, which saves the users' time.

In case of consumer decisions, direct defaults (in contrast to "smart" and "alternative" defaults) are used for generic products (product's brand doesn´t play a role in the consumer´s decision making process). The limited use of direct defaults in case of consumer goods is connected with the fact that consumers are mostly looking for the maximisation, but not satisfaction (in contrast to health related decisions, when individuals often need to achieve a certain satisfying).

In entrepreneurship in agriculture promotion, defaults can't be used directly on potential entrepreneurs as the entrepreneurial decision represents a single long-term decision which demand analysis of sufficient amount of information. However, the defaults can be used in indirect promotion of the sphere through increase in consumption of locally produced food. Locally produced agricultural food might be placed into specially decorated shelves in supermarkets on the most visible and easy to reach level, at the entrants and at the cash machines, etc. The governmental programs of locally produced food supply in kindergartens, schools and other organisations might be considered as utilisation of defaults as a nudging instrument.

Picture 2. Examples of "Buy local" Adds in Supermarkets.

This nudge instrument, which includes special marks or shelves for the products, produced by the local farmers, doesn't demand significant financial resources. Also, this way of indirect entrepreneurship in agriculture motivation is not solely a Default instrument. The "buy local

mark" assumes certain implied benefits of the local products, which might be higher quality or social preference issue. In that case, the Default nudge is applied together with other approaches.

The *Understanding Preferences* nudge represents a complex instrument. The nudge assumes that the Decision Maker, consumer or entrepreneur, sometimes makes biased decision due to the problem context effect, overload by information, difficulties in determining priorities, etc. S. Bond in his research (2008) shows that "in three empirical studies, participants consistently omitted nearly half of the objectives that they later identified as personally relevant". The problem of identifying preferences and their importance as well as the influence of the environment (decision maker's mood, problem context), decision biases such as "asymmetric dominance" or "attraction effect" which appear when a dominated alternative influences the final choice are some of the problems, which the nudge might eliminate.

Understanding Preferences nudge assumes helping the decision maker in context influence and choice biases avoidance as well as in identification of preferences or decision criteria.

The mark "Buy local", presented on Picture 2 represents both Default and Understanding Preference nudge. It attracts attention of the buyer to one product out of a number of other; the green color is often used on "buy local" ads and is associated with health and nature (Cavelzani and Esposito 2010) what also influences the consumer. "Buy local" mark also attracts attention to certain characteristics, which are associated with the locally produced products, according to the consumers' point of view. The locally produced food is often considered as healthier and also as more ethical choice (as it supports the local farmers). So the "buy local" mark attracts the consumers' attention to the product's characteristics, about which they probably were not thinking before they saw the mark. Attraction of customers' attention to locally produced agricultural products in supermarkets is a popular trend nowadays. Appendix I presents examples of such promotions in France, United States and Russia.

The Understanding Preferences nudge demands more research on possible ways of its application in agricultural entrepreneurship promotion.

Expecting Error nudge is used in a variety of cases, which are often related to repeated decisions or actions such as using the subway control system, using ATM cards, taking pills, etc. The expecting error nudges are focused on avoiding mistakes, such as forgetting a credit card in a machine (now the machine delivers back the credit card immediately, what minimises the probability of an error), putting a metro ticket into the machine not in a correct way (the system can be programmed in such a way that the ticket works no matter by which side the

person puts it inside), etc. The possible areas of the nudge application don't include the conscious consumption choice and the entrepreneurial decision, what makes the nudge application in the agricultural entrepreneurship promotion unlikely.

Giving feedback assumes a feedback information, provided to the decision maker after the decision is made, giving feedback can be considered as an effective instrument in agricultural entrepreneurship promotion. The nudge can be applied to the consumers after the local farmers' products buying. A "thank you" check or separate paper, or anything which would show appreciation of the consumer's decision to buy local farmer's food might give additional motivation to consume "buy local" products again.

Picture 3. Example of a Giving Feedback Nudge.

This Chapter demonstrated how Nudge approaches could be implemented in agricultural entrepreneurship promotion through influencing potential entrepreneurs or consumers. The next chapter would consider in more detail how agricultural entrepreneurship can be promoted through influencing the consumers' behaviour.

4.4 Entrepreneurship in Agriculture Promotion Through Consumers.

The previous chapters have demonstrated that one of the approaches of agricultural entrepreneurship promotion might be the promotion of entrepreneur's products to consumers. This approach has several effects: it increases the consumption of the products, improves the image of the agricultural entrepreneurs, assists in supply chain creation and helps in building agricultural business communities ("Markets can have a community value, as there is often a social purpose to stalls – they can be public spaces as well as retail outlets." says E. Gill the manager of "Love Your Local Market").

Special shelves for the locally produced food in supermarkets, well organised farmers markets and farmers products exhibitions help agricultural entrepreneurs in supply chain creation and delivering their products to the market. The image of the agricultural entrepreneurship is also improved by the promotion of the locally produced products and farmers.

The Farmers Market Promotion Program (FMPP), started in the US in 2002, is focused on "increase domestic consumption of, and access to, locally and regionally produced agricultural products".

As it was previously mentioned, "Buy local" trend often receives governmental support and is promoted through media and advertisement. The "buy local" consumption is presented as a safer for the environment choice with orientation on social preference (Blanchard, 2006). "Seven reasons to shop locally" article in The Guardian, "Buying Local: How it Boosts the Economy" in Time describe the choice of locally produced agricultural products as "more ethical", "supporting local entrepreneurs", cheaper ("can get a better deal") and of higher quality. The health and economic benefits of locally produced products are also often highlighted in promotion campaigns.

These methods can be considered as indirect promotion of hereditary entrepreneurship in agriculture as increase in consumption, creation of new supply opportunities provide more opportunities for existing farmers. However, the methods, focused on consumers, might also influence potential non-hereditary entrepreneurs. The individuals, who are considering entrepreneurial career in the sphere of agriculture, analyse the business opportunities, which include the supply opportunities, product demand and opportunities to get to the supermarket shelves. The image of the locally produced agricultural food as a better choice influence the perception of the business opportunities of the agricultural sphere.

4.5 Behavioural Economics and Non-pecuniary Agricultural Entrepreneurship Determinants.

The previous chapters described several important aspects, which Behavioural Economics adds to the agricultural entrepreneurship promotion. These aspects include importance of diversification of hereditary and non-hereditary entrepreneurship in motivation methods creation, utilisation of the NUDGE instruments and necessity of biases avoidance. Another important contribution of the BE is consideration of non-pecuniary entrepreneurship determinants.

The non-pecuniary factors are non-financial criteria or benefits, which can be acquired by choosing a certain alternative. The non-financial gains, which firstly come to mind (which were also mentioned by Fursdon, 2013) in case of agricultural sphere, are opportunity to live in the countryside, surrounded by nature, breathe fresh air, consume high quality food, "feel at peace with yourself" and find calmness and harmony. This narrative description of the agro-sphere, however, might get into contradiction with perceived non-pecuniary benefits of other business spheres, such as "proving oneself superior to others", achieving success, opportunity to make your own decisions, etc. If an individual considers several possible industries for entrepreneurship, he often evaluates alternatives by a number of criteria, which include financial benefits and non-financial factors. Due to the biased perception of the agricultural sphere, entrepreneurship in this industry might be underestimated not only by financial criteria but also by non-financial. As it was discussed in the previous chapter, individuals often have a biased perception of the industry as not innovative, lacking opportunities for growth and development and not prestigious. Another reason is that the entrepreneurship is often divided into urban and rural (Faggio and Silva (2014), Nielsen and Freire-Gibb (2010)), due to what rural entrepreneurship, in other words, entrepreneurship in agriculture, is considered as an entrepreneurial path significantly different in its characteristics and benefits from the urban entrepreneurship.

The previous chapter on agricultural business biased perception has made a list of five biased perceptions of the industry, according to which the industry can be considered as non-innovative, not creative, not profitable, limited in opportunities and not prestigious. The paper has proven that this description of the agricultural entrepreneurship is biased. These perceived characteristics of the sphere can be divided to financial and non-financial; creativity, prestige and innovativeness can be considered as non-pecuniary factors in entrepreneur's decision

process. As a consequence, the biased perception causes biased evaluation of the agricultural sphere non-pecuniary benefits.

In order to evaluate how the sphere is perceived in terms of the non-financial decision criteria, the common list of non-pecuniary benefits of entrepreneurship should be created. Existing literature on non-financial benefits of entrepreneurship is scarce. The goal of the next Part of the Thesis would be to create a classification of non-pecuniary benefits of entrepreneurship, applicable in any sphere of business, including agriculture.

5. CONCLUSION.

The existing literature on entrepreneurship in agriculture is limited as well as the existing ways of agro-business promotion. However, the existing research provides understanding of the peculiarities of the agricultural business, which is represented by significant influence of the territorial context, which divides the rural agriculture to lowland and mountain areas and assumes significant differences in business opportunities. The territorial context also divides the areas according to whether the area is leading or lagging, relying on agriculture or tourism, peri-urban or remote.

Despite the differences between rural entrepreneurship subgroups, the importance of entrepreneurship in agriculture is undeniable and promotion of agricultural entrepreneurship remains one of the important directions of investments and the rural policies play a significant role in its support.

The first and second pillar of the 2014-2020 Common Agricultural Policy demonstrate a number of effective instruments, applied for agricultural entrepreneurship promotion, which include direct payments to farmers, common organisation of the markets and rural development policy, which is focused on promoting knowledge sharing and innovations, increasing competitiveness of all types of agriculture, etc.

The CAP is also focused on answering the current challenges in agriculture, which include food security and globalisation, declining rate of productivity growth, soil and water quality and threats to biodiversity and many others.

The Paper suggests a number of new approach to agricultural entrepreneurship promotion based on the Behavioural Theory application.

As it was proven in the Paper, consideration of agricultural entrepreneurship peculiarities from the Behavioural Economics perspective can provide a significant contribution to the

existing literature and research on agro-business promotion. The diversification of agricultural entrepreneurship into hereditary and non-hereditary was based on the application of Behavioural Economics and differences in decision making process of these two groups of entrepreneurs. As the Paper demonstrates, potential non-hereditary entrepreneurs might have a biased perception of the agricultural sphere due to a larger number of career alternatives, stereotypes connected with the agricultural business and limited information of the agro-sphere opportunities. The paper considers these factors together with the influence of overoptimism, overconfidence and non-pecuniary factors in entrepreneur's decision making process.

As it was considered in the Paper, BE also provides potential instruments for agro-business promotion such as Nudges, aimed at influencing individual's behaviour without direct enforcement. The five types of nudges and ways of their utilisation in agro-business promotion were discussed in the paper.

The biased perception of agro-sphere is one of the reasons of limited effectiveness of the existing promotion methods. The Paper opens a discussion about possible ways of biases avoidance, stressing the fact that BE focus is on biases and heuristics identification and elimination.

The importance of non-pecuniary benefits in entrepreneur's decision making process should be also taken into account in agro-sphere promotion methods development. The biased perception of the sphere is the reason of underestimation of the industry by the non-financial criteria. The paper also stresses the importance of indirect promotion of agro-entrepreneurship through consumers.

Taking into account the limitations of the existing approaches to agricultural entrepreneurship motivation, application of Behavioural Economics instruments might create more cost-effective ways of promotion, focused on influencing individual's decision making process.

REFERENCES.

1. 2006 The New Rural Paradigm. Policies and Governance. *OECD Rural Policy Review.*
2. 2007. "Exploring the significance of entrepreneurship in Agriculture". *European Commission funded Report.*
3. 2012. "Promoting farmer entrepreneurship through producer organizations in Central and Eastern Europe". *FAO Report.*
4. 2013 "Labelling of agricultural and food products of mountain farming". *European Commission External Study. Executive summary.*
5. 2013. Overview of CAP Reform 2014-2020. Agricultural Policy Perspectives Brief. European Commission.
6. Abdullah, A. Sulaiman, N. (2013). "Factors that influence the interest of youths in Agricultural Entrepreneurship". *International Journal of Business and Social Science Vol. 4 No. 3; pp 288-302.*
7. B. Helmrich (2014). "120 Reasons being Entrepreneur is awesome." *Business News Daily.*
8. Banerjee, A.V. and A.F. Newman (1993). "Occupational choice and the process of development". *Journal of Political Economy, 101, 274-298.*
9. Baumgartner D., Schulz T. and Seidl I. (2012). "Quantifying entrepreneurship and its impact on local economic performance: A spatial assessment in rural Switzerland " *Entrepreneurship & Regional Development.*
10. Bazerman, M., Moore A. 2012. "Judgment in Managerial Decision Making'. *Eighth Edition. Wiley.*
11. Bhide, A. 2012. "Entrepreneurship determinants: culture and capabilities". *Eurostat Statistical Book.*
12. Blanchard, T. Matthews, T. (2006) "The configuration of local economic power and civic participation in the Global Economy" *Social Forces.* Vol. 84, No. 4; pp. 2241-2257.
13. Brezzi, M., Piacentini, M. 2010. "Labour Mobility and Development Dynamics in OECD Regions" OECD Workshop Migration and Regional Development.
14. Calvo, G. and S. Wellisz 1980. "Technology, entrepreneurship and firm size." *Quarterly Journal of Economics, 95, 663-677.*
15. Camerer, C. 2004. "Behavioural Economics: past, present and future" *Advances in Behavioural Economics, Princeton: Princeton University Press.*

16. Cartwright, E. 2011. "Behavioural Economics". *Routledge Taylor &Francis Group. London and New York.*

17. Cavelzani, A., Esposito, M. (2010) "Emotional Intelligence and Hospitality." *Tate Publishing and Enterprises, LLC.*

18. Chugh, D., Bazerman, M., Banaji, M. (2005) "Bounded ethicality as a psychological barrier to recognizing conflicts of interest." *Cambridge University Press. Pp. 1248-51*

19. Clark, J. (2009) "Entrepreneurship and diversification on English farms: identifying business enterprise characteristics and change processes." *Entrepreneurship & Regional Development: An International Journal. 21:2, 213-236*

20. Coburn, T. (2015) "Milking taxpayers." *The Economist.*

21. Cooper, A., Woo C., and Dunkelberg W. 1988. "Entrepreneurs perceived chances for success".

22. Cuervo, A., Ribeiro, D., Roig, S. (2007) "Entrepreneurship. Concepts, Theory and Perspective". *Springer Berlin Heidelberg New York.*

23. Davidova, S. and Thomson, K. (2014). Family farming in Europe. Challenges and prospects, document pre-pared for the European Parliament's Committee on Agriculture and Rural Development, Brussels .

24. Díaz-Pichardo, R. (2012) "From farmers to entrepreneurs: The importance of associative behaviour." *Paper presented at the annual meeting of the BALAS Annual Conference, Universidad Adolfo Ibanez, Santiago, Chile.*

25. DiGiacomo, F. "Sting and Trudie's Tuscany: an Organic Tale." *Food and Wine.*

26. Faggio, G., Silva, O (2014) "Self-employment and entrepreneurship in urban and rural labour markets" *Journal of Urban Economics, 84: 67-85.*

27. Francis, J. (2008) "From the responsible travel archives: Agrotourism – a growing trend in the UK." *Responsible Travel.*

28. Fursdon, D. (2013) "We need to get young people excited about farming." *The Guardian.*

29. Gabaiz, X. 2014. "A Sparsity-based model of bounded rationality". *The Quarterly Journal of Economics, 1661–1710*

30. Gosden, E (2016) "Farmers' leader seeks government subsidy equal to support given by European Union'". *The Telegraph.*

31. Green, D. 2014. "Who wants to farm? Hardly any young people, it seems. Should/Could that change?" From Poverty to Power. *Oxfam.*

32. Hamilton, Barton H. 2000 "Does entrepreneurship pay? An empirical analysis of the returns to self-employment." *Journal of political economy 108 (2): 604-31.*

33. Hansbury, M. 2009. “The Problem behind all problems.” *Epitome Books.*

34. Harrington, M. 2010. “Are you a pirate.” *Techcrunch, Oct. 31.*

35. Holm, Hakan J., Sonja Opper, Victor Nee. 2013. “Entrepreneurs under Uncertainty: An Economics Experiment in China.” *Management Science 59 (7): 1671-87.*

36. Huylenbroeck, G., Durand, G. (2003) “Multifunctional Agriculture: A New Paradigm for European Agriculture and Rural Development.” *Ashgate,* ISBN: 0754635767

37. Jostein, V., McElwee, G. (2011) “Diversification and the Entrepreneurial Motivations of Farmers in Norway*.” Journal of Small Business Management, 49 (3). pp. 390-410. ISSN 0047-2778*

38. Kahneman, D., Tversky, A. (1979) “Prospect Theory: An Analysis of Decision under Risk.” *Econometrica, Vol. 47, No. 2, pp. 263-291.*

39. Keeney, R., Raiffa, H. 1976 “Decisions with Multiple Objectives.” *Wiley, New York.*

40. Kihlstrom, R.E. and J. J. Laffont 1979. “A general equilibrium Entrepreneurial Theory of firm formation based on risk aversion*.” Journal of political Economy, 87, 719-749.*

41. Kirzner, I. (1979) *Perception, Opportunity and Profit,* Chicago University of Chicago Press.

42. Knight, F.M. 1921. “Risk, Uncertainty and Profit”. *New Yourk,Houghton-Mifflin.*

43. Kremer, W. Hammond, C. 2013. "Abraham Maslow and the pyramid that beguiled business". *BBC news magazine.*

44. Krueger, N.F. (2000): “The cognitive infrastructure of opportunity emergence”. *Entrepreneurship Theory and Practice, 24*(3): 5–23.

45. Laquinta, D., Drescher, A. “Defining the peri-urban: rural-urban linkages and institutional connections.” *Food and Agriculture Organisation.*

46. List J. 2004. “Neoclassical theory versus prospect theory: Evidence from the marketplace.” *Econometrica, 72: 615-625.*

47. Loewenstein G. and Prelec D. 1993. “Preferences over sequences of outcomes*.” Psychological Review, 100:91-108.*

48. Lucas, R 1978. “On the Size Distribution of Business Firms.” *The Bell Journal of Economics 9(2): 508–523.*

49. Madureira, L., Koehnen, T., Pires, M., Ferreira, D., Cristóvão, A., Baptista, A. (2015). “Advisory services for small scale farmers: how effective are their responses to farmer needs and demands?” *WP 4 – Akis on the Ground: Focusing Knowledge Flows System. Topic 1 Synthesis Report*. www.proakis.eu

50. Marsden, T., Smith E. (2005) Ecological Entrepreneurship: sustainable development in local communities through quality food production and local branding. *Geoforum, 36: 440-451.*

51. Massot, A. (2016) "First pillar of the Common Agricultural Policy (CAP): II – Direct payments to farmers". *European Parliament.*

52. McElwee G. 2007. The split entrepreneurial identity of the farmer, Journal of Small Business and Enterprise Development, Vol. 14 No. 1, pp. 48-54

53. McElwee, G. and Smith, R. 2012. Classifying the strategic capabilities of farmers: a segmentation frame-work, International Journal of Entrepreneurial Venturing, 4 (2). pp. 111-131. ISSN 1742-5360

54. McElwee, G. and Smith, R. 2014. Researching rural enterprise. In Fayolle, A. (ed.) Handbook of research on entrepreneurship: what we know and what we need to know. Cheltenham: Edward Elgar [online], Chapter 14, pp. 432-470.

55. McElwee, G. (2006). "Farmers as Entrepreneurs: Developing Competitive Skills". *Journal of Developmental Entrepreneurship.* 11, 187.

56. Monbiot, G. (2013) "Farming subsidies: this is the most blatant transfer of cash to the rich". *The Guardian.*

57. Nielsen, K. L.,and Freire-Gibb, C. (2010) "How Important is Geography for the Entrepreneurial Profile?" *presented at the DRUID-DIME Academy Winter 2010 PhD Conference on Comwell Rebild Bakker,* Aalborg, Denmark, January 21 - 23.

58. O'Connell, J. (2013) "Seven Reasons to Shop Local." *The Guardian.*

59. Panchal R. and K Dua 2013. "A study on motivational factors for becoming the women entrepreneur in Haryana (India)." *Abhinav. International Monthly Refereed Journal of Research In Management & Technology.*

60. Parker, Simon C. (2009) "The Economics of Entrepreneurship". *Cambridge University Press.*

61. Perez, J. (2000) "Rural development in Europe: the EU Leader programme reconsidered. The Leader Programme and the rise of rural development in Spain". *Sociologia Ruralis, Vol. 40 (2).*

62. Petrin, T. 1994. "Entrepreneurship as an economic force in rural development". *FAO, Regional Office for Europe. Viale delle Terme di Caracalla, 00100 Rome, Italy.*

63. Pitt-Watson, D. (2014) "Entrepreneurship is a basic freedom" *Stanford Graduate School of Business.*

64. Pyysiäinen, J. 2013. "Activating farmers: uses of entrepreneurship discourse in the rhetoric of policy implementers." *Discourse & Communication 7(1) 55 –73*

65. Ragonnaud, G (2016) "Second pillar of the CAP: rural development policy". *European Parliament*.

66. Raman K. and S. Jayasingam. 2008. "Motivational factors affecting Entrepreneurial Decision: a comparison between Malaysian women entrepreneurs and women non entrepreneurs". *International Business Information Management Association. Volume 2.*

67. Rogers, P. (2013) "Infobesity: the enemy of good decisions" *Bain and Company.*

68. Rudmann, C., Vesala, K.M., Jäckel, J. (2008). Synthesis and recommendations. In: Rudmann, Christine (Ed.) (2008): Entrepreneurial Skills and their Role in Enhancing the Relative Independence of Farmers. Results and Recommendations from the Research Project Developing Entrepreneurial Skills of Farmers. *Research Institute of Organic Agriculture, Frick, Switzerland.*

69. Schumpeter, J.A. 1934. "The Theory of Economic Development". *Cambridge MA, Harvard University Press.*

70. Schwartz, J. (2009) "Buying local: How It boosts the Economy." *Time.*

71. Shane, S. (2013) "Why entrepreneurs choose freedom over money". *Entrepreneur.*

72. Shane, S.A. & Venkataraman, S. (2000). "The promise of entrepreneurship as a field of research". *Academy of Management Review*, 25 (1): 217–226.

73. Shane, Scott A. (2009) "Fool's Gold? The truth behind angel investing in America." *Oxford University Press.*

74. Shuai Liu, A. 2014. "Five reasons why youth should choose agriculture." *The World Bank.*

75. Simon H. (1955) "A behavioural model of rational choice". *Quarterly Journal of Economics, 69: 99-118.*

76. Singer, S. et al (2014) "Global Entrepreneurship Monitor." *Global Report.*

77. Stathopoulou, S., Psaltopoulos, D. Skuras, D. (2010),"Rural entrepreneurship in Europe" *International Journal of Entrepreneurial Behaviour & Research*, Vol. 10, pp. 404 – 425.

78. Stroud, C. (2011) "Agrotourism: from farm to folk". *National Geographic. Traveller.*

79. Sutherland, L. (2015) "EIP-AGRI Focus Group new entrants into farming: lessons to foster innovation and entrepreneurship". *Discussion Paper.*

80. Sulaiman, N., Abdullah, A. (2013). "Factors that influence the interest of youths in Agricultural Entrepreneurship". *International Journal of Business and Social Science Vol. 4 No. 3; pp 288-302.*

81. Thomas Asterbo, Holger Herz, Ramana Nanda, Roberto A. Weber (2014) "Seeking the roots of entrepreneurship: Insights from Behavioural Economics". *Journal of Economic Perspectives. Volume 28, Number 3.*

82. Welter F. (2011). Contextualising entrepreneurship. Conceptual challenges and ways forward, *Entrepre neurship theory and practice*, 35(1): 165-184.

83. Wit, G. de (1993) "Models of self-employment in a competitive in a competitive market". *Journal of Economic Surveys, 7, 367-397.*

APPENDIX I. "Buy Local" adds in US, France and Russia.

Picture 1. "Buy Local" in the US.

"Buy Local" in France.

"Buy Local" in Russia.

Part II. Policy Effect on Entrepreneurial Decision Modeling and Entrepreneurship Criteria Classification.

1. INTRODUCTION.

The Paper "Policy Effect on Entrepreneurial Decision Modeling and Entrepreneurship Criteria Classification" is the Part II of the Thesis "Behavioural Economics and Decision Theory Application in Agricultural Entrepreneurship Promotion".

This Paper is based on the results and conclusions of the Part I of the Thesis, "Behavioural Economics Application in Entrepreneurship in Agriculture Promotion". The Part I has demonstrated that agricultural entrepreneurship motivation is an important direction of research. The Policy Makers believe that farmers need to be activated into entrepreneurship. A considerable number of initiatives, funds and international projects are devoted to agricultural entrepreneurship promotion. The main contribution of the Paper I can be presented as four key conclusions:

1. The agricultural entrepreneurship can be divided into hereditary and non-hereditary. Non-hereditary entrepreneurship in agro sphere is more effective, it brings new technologies, networks, capital, education and knowledge into the industry, however the existing methods of agricultural entrepreneurship promotion are mostly focused on hereditary entrepreneurship.
2. The entrepreneur's perception of agro-sphere and its opportunities is biased. The limited knowledge about market potential, business opportunities, development perspectives, governmental regulations, infrastructure and available technologies decreases the effectiveness of agricultural entrepreneurship promotion.
3. The non-pecuniary benefits of entrepreneurship play an important role in potential entrepreneur's decision making process, due to what the non-financial determinants of entrepreneurship should be taken into account by the Policy Makers.
4. New instruments of agro-sphere promotion should be more focused on non-hereditary entrepreneurs, the new methods of promotion might be based on Behavioral Economics application, NUDGE Theory and principles of perception biases avoidance.

The Paper II of the Thesis will create a basis for new approaches of agricultural entrepreneurship promotion and ways of their effectiveness assessment. Paper II will apply the results and conclusions of the "Behavioural Economics Application in Entrepreneurship in Agriculture Promotion" Paper and focus on the aspects, which are crucial in agricultural entrepreneurship promotion policy planning and its effectiveness assessment.

The agricultural entrepreneurship promotion is inextricably linked with the factors, which influence the number of entrepreneurs in the industry. These factors are often addressed as *Entrepreneurship Determinants*. Determinant is a factor, element or circumstance that influences or determines. Theoretically, knowing the full list of determinants of entrepreneurship and their influence we can predict the quantity and quality of entrepreneurship and the exact effect of a certain policy on entrepreneurship in a particular sphere or region.

According to the United Nations "Conference on Trade and Development" (2015) in order to measure the effectiveness of entrepreneurship policies, three main steps should be taken:

1. Define the scope of entrepreneurship.
2. Develop a conceptual framework for entrepreneurship indicators.
3. Select a list of core internationally comparable indicators.

Entrepreneurship indicators, according to the OECD Report "A Framework for Addressing and Measuring Entrepreneurship" (2008) are: determinants (policy actions), entrepreneurial performance and impact (policy objectives) indicators.

The Determinants of Entrepreneurship and their influence are the central questions in entrepreneurship promotion strategy.

In literature, Entrepreneurship Determinants (as it will be seen from the following chapters) are considered from different perspectives. The entrepreneurship in agriculture promotion approaches can be based on one of the entrepreneurship determinants classifications, however the difference in approaches to entrepreneurship determinants might decrease the policy effect.

One of the Paper II contributions is differentiation of four different perspectives on entrepreneurship determinants, which would be shortly presented in the next paragraphs 1.1 and 1.2.

In Paper II a new classification of entrepreneurship determinants (based on the perspective, which determines the policy effect) will also be created and checked. A model of policy effect on entrepreneurial decision will be also created. The paragraph 1.3 will present the methodology of the policy effect on entrepreneurial decision modeling and the strategy of creation of new classification of entrepreneurship determinants.

1.1 Two Perspectives on Entrepreneurship Determinants.

Based on the existing literature review, in Chapter "New Framework for Entrepreneurial Decision" presented further, I divided entrepreneurship determinants classifications into two groups according to the perspective: Policy Maker's perspective and Potential Entrepreneur's (or Decision Maker's) perspective.

Policy Makers are considering a country, a certain territory or a particular industry or business sphere; they are evaluating all the possible factors, which influence the quantity and quality of entrepreneurship in a certain area or sphere.

Another perspective is presented by Potential Entrepreneur's point of view. Potential Entrepreneur might be considering different industries, or he/she might focus on a certain particular business sphere in which he/she is currently involved as a worker. Entrepreneur also evaluates all the pros and cons of entering a certain sphere, he/she sees opportunities and threats, evaluates his/her skills and resources.

On the one hand, both Decision Makers and Policy Makers consider the same factors, but on the other hand, different ways of seeing the same factors might cause a significant decrease in the effectiveness of the policies implemented.

Policy Makers are aware of factors external for the entrepreneur, such as market conditions and opportunities, legislation, infrastructure, etc. Also, they are considering factors, which are internal for the entrepreneurs, such as skills, knowledge, education and financial opportunities. This perspective will be called the Policy Maker's perspective.

From the Potential Entrepreneur's point of view (the Decision Maker's perspective), the situation is different: he/she often has a biased perception of the market opportunities and threats and has a limited knowledge about external factors. The internal assets are also evaluated subjectively by the Decision Maker, due to such behavioural peculiarities of entrepreneurs as overoptimism and overconfidence (considered in Part I of the Thesis). The Potential Entrepreneur, who is considering possible spheres of business often eliminate agricultural sphere from his/her list of alternatives due to biased perception of the sphere, as it was discussed in Part I of the Thesis.

Entrepreneurship in the agricultural sphere depends on the Decision Maker's perspective, as it's the potential entrepreneur who makes a decision to enter the sphere of agriculture. The biased perception of external factors and assets create significant divergence between Decision Maker's and Policy Maker's perspectives and decreases the effectiveness of the agricultural entrepreneurship promotion, performed by the Policy Makers.

With a closer look at Entrepreneurship Determinants classification, based on the Decision Maker's perspective, I've divided the Determinants into two subgroups: *Factors* and *Gains* (based on the Decision Maker's point of view).

1.2 Factors and Gains as Entrepreneurship Determinants.

Factors are the external and internal determinants that influence entrepreneurs' decision, which include the analysis of all known factors, such as market conditions, financial opportunities, etc. Gains represent a different perspective on Potential Entrepreneur's point of view. Any decision, according to the Decision Theory, is based on gains, which the Decision Maker expects to receive from his/her decision. In other words, the Decision Maker expects certain benefits from his/her choice of agricultural sphere. The *Factors* and *Gains* perspectives are strongly connected. The Decision Maker expects a number of benefits from entrepreneurship based on the external factors and his/her internal assets. As a result, biased perception of external and internal factors cause a biased perception of future Gains.

From the received Entrepreneurship Determinants structure, we can conclude that certain policy, aimed at promotion of entrepreneurship in agriculture influences the perceived external (and sometimes internal, if it's education, for example) factors, which the Decision Maker (DM) analyses. These factors might influence the Gains, which the DM expects to receive and might affect the Decision (or the probability of decision) to become an entrepreneur in the sphere of agriculture.

The differentiation of entrepreneurship determinants classifications based on Policy Maker's (PM) and Decision Maker's (DM) perspectives, as well as DM Factors and Gains perspectives will be explained in detail in this Paper. This short overview of these concepts was presented in the Introduction in order to clarify the Paper philosophy and methodology.

1.3 Policy Effect Modelling and Entrepreneurship Determinants Classification Creation.

Modelling the Effect of a Policy on Entrepreneurial Decision might be a useful contribution to the existing literature on Entrepreneurship in Agriculture Promotion. Entrepreneurial Decision is the decision of an individual (potential entrepreneur) to become an entrepreneur in

a certain sphere (in this research, the sphere of agriculture). The model can be divided into two elements: model of the Policy Effect and Model of the Entrepreneurial Decision. The Policy Effect part will be modelled applying econometrical framework, while Entrepreneurial Decision will be modelled applying Decision Theory. Decision Theory is the study of how choices are and should be made in different contexts (Bradley, 2014). The Entrepreneurial Decision modelling also implies creation of entrepreneur's determinants classification, which would be used in the model.

The created model might assist in the policy effectiveness forecasting through providing information on entrepreneurship determinants and their influence and by providing new tools and instruments in Policy Effect prediction.

The model would also take into account the conclusions of the Part I of the Thesis. First of all, it would be focused on non-hereditary potential entrepreneurs in the agricultural sphere. Secondly, it would take into account the non-pecuniary (non-financial) benefits of entrepreneurial career, which might be considered as entrepreneurial Gains. Thirdly, it would take into account the non-financial approaches to agricultural entrepreneurship promotion, in other words, it would be applicable for modelling the effect of non-financial promotional methods. Part III of the Thesis would present the Experiment, conducted with the use of created model of the Policy Effect.

The Paper II will have two main goals:

1. To create a Model of a Policy Effect on Entrepreneurial Decision, based on Decision Theory, applicable in policy effectiveness assessment.
2. To create a classification of Entrepreneurship Determinants, applicable in an experiment.

The model of a Policy Effect on Entrepreneur's Decision will be based on:

1. Decision Theory application,
2. Integration of Econometric and Decision Theory approaches.
3. Following the principle of universality,
4. Achieving applicability in an experiment devoted to policy effectiveness assessment.

The new classification of entrepreneurship determinants will be based on:

1. Consideration of both Policy Maker's and Decision Maker's perspective,
2. Top-down and bottom-up approaches.
3. Achieving applicability in an experiment devoted to policy effectiveness assessment.

In order to achieve the Project goals the following steps will be taken:

1. The existing classifications of entrepreneurship determinants and existing occupation models will be analysed,
2. Econometric and Decision Theory Frameworks will be applied in order to model the policy effect on entrepreneurial choice of the Decision Maker.
3. Classification of Entrepreneurship Determinants will be created.
4. Classification of Entrepreneurship Gains will be created.
5. The Gains classification will be tested.

2. NEW FRAMEWORK FOR ENTREPRENEURSHIP DETERMINANTS.

Entrepreneurship Determinants is an important topic for the Policy Makers as they are expected to determine the level of entrepreneurship in a certain sphere or region. Certain policy or action, aimed at promoting entrepreneurship, is expected to influence through one of the determinants. The existing literature suggests different perspectives on Entrepreneurship Determinants. This Chapter goal is to create a new framework, which would help in better understanding of the effect of a policy on the level of entrepreneurship.

2.1 Existing Approaches to Entrepreneurship Determinants.

The Entrepreneurship Determinants and Occupational Choice models are two related topics. Entrepreneurship Determinants are expected to determine the number of entrepreneurs in the sphere. Occupational Choice model, which considers entrepreneurship as a career alternative, evaluates the decision of a single Decision Maker concerning entrepreneurial career. As a result, the Entrepreneurship Determinants influence the Occupational Choice of each individual. This Chapter will consider existing classifications of Entrepreneurship Determinants and existing Occupational Choice models, which include the entrepreneurial career option.

The existing classifications of Entrepreneurship Determinants mostly consider entrepreneurship from the Policy Maker's perspective. According to the Eurostat Report on

Entrepreneurship determinants (2015), most researches agree on three key factors determining entrepreneurship: *opportunities*, *skilled people* and *resources*.

Resources include access to capital, R&D and technology, skilled people imply capabilities of the entrepreneur and access to entrepreneurial infrastructure, and opportunities mean market conditions created by the country. Opportunities include public policies and intervention, competition, access to foreign markets, procurement regulations, etc.

The Organisation of the Economic Cooperation and Development (OECD) extends the list to five groups of determinants: *opportunities, skilled people, resources, regulatory framework and culture.* The regulatory framework includes taxes, regulations and other public rules and institutions affecting entrepreneurship. Culture includes individual's assumptions, perceptions, etc. This classification considers entrepreneurship from the Policy Maker's perspective.

Another classification of entrepreneurship determinants is presented by OECD „Entrepreneurship at a Glance 2012", which includes the analyses of factors that influence a country's entrepreneurial performance. These factors include *regulatory framework, market conditions, creation and diffusion of knowledge, entrepreneurial capabilities, access to finance* and *entrepreneurship culture*.

Table 1. Entrepreneurship Determinants.

Determinants						Entrepreneurial performance	Impact
Regulatory framework	Market conditions	Access to finance	Knowledge creation and diffusion	Entrepreneurial capabilities	Culture	Firm based	Job creation
Administrative burdens for entry	Anti-trust laws	Access to debt financing	R&D investment	Training and experience of entrepreneurs	Risk attitude in society	Employment based	Economic growth
Administrative burdens for growth	Competition	Business angels	University/ industry interface	Business and entrepreneurship education (skills)	Attitudes towards entrepreneurs	Wealth	Poverty reduction
Bankruptcy regulation	Access to the domestic market	Venture Capital	Technological co-operation between firms	Entrepreneurship infrastructure	Desire for business ownership		Formalising the informal sector
Safety, health and environmental regulations	Access to foreign markets	Access to other types of equity	Technology diffusion	Immigration	Entrepreneurship education (mindset)		
Product regulation	Degree of public involvement	Stock markets	Broadband access				
Labour market regulation	Public procurement						
Court and legal framework							
Social and health security							
Income taxes : wealth/bequest taxes							
Business and capital taxes	Patent system standards						

Firms	Employment	Wealth
Employer enterprise birth	Share of high growth firms	Share of high growth firms (by turnover)
Employer enterprise death rates	Share of gazelles (by employment)	Share of gazelles (by turnover)
Business churn	Ownership rate start-ups	Value added, young or small firms
Net business population growth	Ownership rates business population	Productivity contribution, young or small firms
Survival rates at 3 and 5 years	Employment in 3 and 5 year old firms	Innovation performance, young or small firms
Proportion of 3 and 5 year old firms	Average firm size after 3 and 5 years	Export performance, young or small firms

Source: „Entrepreneurship at a Glance 2012".

The classification is similar to the previous one, but in this classification the market conditions are considered separately from opportunities as well as the creation and diffusion of

knowledge.

The classification presented in the "Entrepreneurship at a Glance 2012" report has several shortcomings. The main disadvantage of the classification is the overlapping between groups of determinants. "Creation and diffusion of knowledge" have a significant effect on "Entrepreneurial capabilities". "Creation and diffusion of knowledge" contains "University interface" and University education obviously influences "Business and entrepreneurship education" (which is included in the "Entrepreneurial capabilities" group of determinants).

Another example of an overlap is the fact that the classification separated "Regulatory framework" and "Access to finance", however the regulatory framework related to banks activities has a direct impact on access to finance.

Therefore, this classification of determinants will have limited applicability in Policy Effectiveness assessment. This conclusion becomes obvious if we think about opportunities for Policy Effect Modelling. The determinants should represent explanatory factors, however strong correlation between determinants will create a problem of multicollinearity, which is a situation in which several predictor variables in a multiple regression model are strongly correlated, consequently the coefficient estimates will be biased.

The entrepreneurship determinants lists are not limited to only general classifications. Less universal classifications are created on country and industry bases, making the analysis customised for a certain geographic region or sector. For example, in a research by K. Raman and S. Jayasingam (2008), the motivating factors, which affect the decision to become entrepreneur are considered by looking at the case of Malaysian women. In the paper by R. Panchal and K Dua (2013) the motivational factors of becoming entrepreneur are considered by referring to the state of Haryana (India).

S. Parker in his book „The Economics of Entrepreneurship" (2009) describes the determinants of entrepreneurship from the Decision Maker's perspective. The determinants in this case are the explanatory factors of individual's decision to become an entrepreneur. The equation is:

$$Z^* = z(Pi\text{-}w, Xhuc, Xsoc, Xrisk, Xpsy, Xdem, Xind, Xmac, Xemp)$$

Where Z* is the unobserved preference to become an entrepreneur, *Pi-w* is the difference between profit from entrepreneurship and alternative wage. *Xhuc* is human capital, *Xsoc* is social capital, *Xrisk* is risk, *Xpsy* and *Xdem* are psychological and demographic factors, *Xind*

are industry-specific, *Xmac* is macroeconomic factors and *Xemp* are characteristics of employers.

Human capital includes age, experience and formal education. Social capital is the ability of an individual to use one's personal connections and network. In his description, Parker brings together attitude to risk and other psychological factors, giving a limited attention to a behavioural explanation of entrepreneurship. Demographic factors include age, health and family background, industry characteristics and macroeconomic factors, such as the influence of technology, are also considered.

According to the Parker's classification, potential entrepreneurs consider external factors, related to the market, industry and country characteristics, internal characteristics such as social and human capital and the financial gains from entrepreneurship.

The classification has a number of shortcomings. The list of determinants includes financial factor *Pi-w* (the difference between salary and entrepreneurial profit) which strongly correlates with other determinants such as industry-specific factors, risk and human capital. Due to this correlation, a problem of multicollinearity will occur if the Parker's classification of determinants is used in a research or experiment.

Parker also includes all the psychological factors, and the attitude to risk, in one group of determinants Xpsy. From the Behavioral Economics perspective, limited attention to psychological factors can be considered as another disadvantage of the classification.

Another shortcoming of the Parker's classification is the fact that the "difference between profit from entrepreneurship and alternative wage" is a criterion, which depends on all the other criteria in his classification. In fact, *Pi-w* can be considered as potential gains, which the Decision Maker expects to receive, while all the other internal and external factors, mentioned by Parker are the factors, which determine this financial gain.

The Parker's classification partly originates from the Occupational Choice model, which implies consideration of the difference between potential income from entrepreneurship and the wage. This model considers all agents as homogeneous and according to the simplest static model if pi > w (where pi is profit from entrepreneurship and w is a wage) an individual chooses to become an entrepreneur (de Wit, 1993).

An approach which takes into account both financial and non-financial benefits was suggested by Sullivan (2006). His Ocupational choice model includes both pecuniary and non-pecuniary criteria:

$$V_{iqt}^{*} = w_{iqt} + H_{iqt} + \varepsilon_{iqt}$$

Where w_{iqt} is the log wage of subject i in occupation q at time t; H_{iqt} is the non-pecuniary utility that person i receives from working in occupation q at time t, and ε_{iqt} is an error term that includes the variation of utility, deriving from working in occupation q caused by factors that are observed by the worker but unobserved by the econometrician.

Sullivan however does not specify the list of possible non-pecuniary criteria, which the Decision Maker is considering.

2.2 New Framework for Entrepreneurship Determinants.

Several classifications presented have one common shortcoming – overlapping between groups of determinants which might cause a problem of multicollinearity if the classifications will be further used in a research or experiment. The entrepreneurship determinants classification should cover all the factors which determine quantity and quality of entrepreneurship, the groups of determinants shouldn't overlap or correlate, the classification should be clear and applicable.

All the lists of determinants considered are devoted to one main goal: identification of determinants, which influence entrepreneurship. Using these determinants, The Policy Maker can better predict the consequences of policies and identify new approaches to entrepreneurship promotion so he/she can increase quantity or quality of entrepreneurship in a certain industry or region. The ability to predict the effect of a policy is crucial.

In econometrical terms, we can say that one of the main goals of the entrepreneurship determinants classifications creation is analysis of causality. Causality connects one process (the cause) to another (the effect of the cause). Economists focus on causality from the perspective of policy evaluation. The econometric approach distinguishes three problems of causality: (a) Defining possible outcomes, (b) Identifying causal models from idealized data of population distributions, and (c) Identifying causal models from actual data (Ichino, 2007). The problem (c) is the one, which the Policy Maker faces: how to analyse or predict the causal effect of a policy on population.

The literature on Entrepreneurship Determinants can be divided into two groups. The entrepreneurship determinants, considered in the Eurostat Report on entrepreneurship determinants and OECD Reports, describe determinants from the point of view of the Policy Maker. Sullivan and Parker describe the entrepreneurship determinants mostly from the point of view of a potential entrepreneur, who considers the opportunities and risks of starting the entrepreneurial career.

This Paper makes an assumption that one of the reasons of limited causal effect of policies is the lack of attention to the differences in *Policy Maker's* and *Decision Maker's* perspectives.

Policy Maker's Perspective.

The Policy Maker (PM) is planning which methods and approaches should be used for entrepreneurship in Agriculture motivation. The PM is fully aware of regulatory framework: administrative burdens for entry, product regulations, environmental regulations, etc. He/she has his/her own perception of entrepreneurial capabilities in society. Also, he/she considers the cultural aspects, such as attitude towards entrepreneurship in society.

Decision Maker's Perspective.

Decision Maker (DM) is a potential entrepreneur, in other words it's an individual who hypothetically can become an entrepreneur in the sphere of agriculture. The Part I of the Thesis divided potential entrepreneurs in agro-sphere into two types: hereditary and non-hereditary. In the Thesis, I'm considering the motivation of the non-hereditary entrepreneurs, as, according to the existing literature, non-hereditary entrepreneurs are more effective and bring capital, business education, networks and new technologies into the sphere of agriculture. The Decision Maker has limited information about the agricultural sphere business opportunities. He/she is often not fully aware about all the regulations and market conditions. Another, more important issue, is that the DM perception of the agricultural sphere is often biased, as it was discussed in the Part I of the Thesis. The DM often underestimates the opportunities of the industry, is not aware about profitable directions of business and growth perspectives.

Also, the sphere of agriculture can be underestimated in terms of the non-pecuniary benefits. The Part I emphasised the importance of the non-financial determinants of entrepreneurial decision. In other words, the decision to become an entrepreneur is explained not only by the possible financial benefits, but also by the non-pecuniary gains, which might be "freedom in choosing work schedule", "opportunity to prove oneself's superior to others", and many others. The existing literature indicates that the agricultural sphere is often considered as less attractive in terms of the non-pecuniary benefits: "Agriculture has never been considered to be a prestigious occupation…." (Kotler, 1990); "Farming and farm support programmes… should improve the image of the sector" (Leavy, 2014); "Ask anyone for their impression of a British farmer and they are likely to describe an aged character with a flat cap and a tweed jacket, ideally sucking a piece of straw" (Fursdon, 2013). The sphere of agriculture is often not considered as innovative, fashionable and perspective, despite of the fact that this point of view

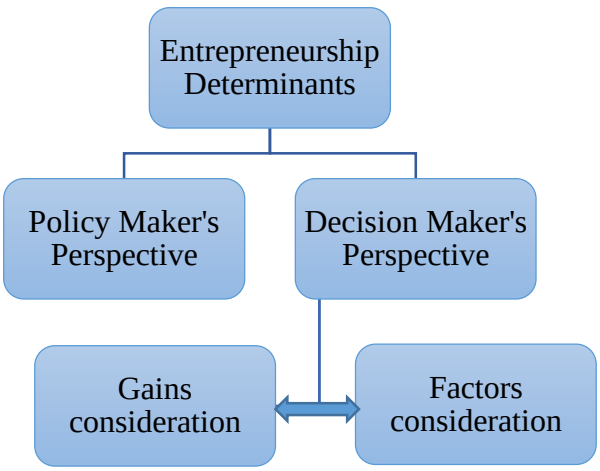
is biased. The Part I of the Thesis has proven that the agricultural sphere is strongly underestimated in terms of the non-pecuniary benefits.

If the Decision Maker's perspective, which is characterized by a lack of information and biased perception, won't be taken into account, the agricultural entrepreneurship promotion methods effect would be limited.

The DM perspective can be also divided into two subgroups. Parker's classification problem (dependence of *Pi-w* on all other determinants), leads to the idea that the Decision Maker's perspective is a more complicated area, which demands distinguishing of two different approaches to decision making : 1) internal and external factors consideration and 2) gains consideration. These two perspectives are clearly seperated in literature: the internal and external factors are considered in OECD and Eurostat Report classification, while gains perspective is considered in Occupation Choice models of de Wit (1993) and Sullivan (2006). Parker (2009) brings together these two perspectives and receives a list of determinants, which are strongly correlated. The conclusion, which can be made, is that these two perspectives of Decision Maker should be considered separately.

The two approaches to determinants are connected: gains, which can be considered by the Decision Maker are evaluated after analyses of all the internal and external factors, known by the Decision Maker. As a result, the entrepreneurship determinants classifications can be presented as follows:

Scheme 1. Entrepreneurship Determinants Classification Scheme.



The importance of the Decision Maker's perspective directs the research to application of Decision Theory as a scientific sphere, which is focused on the decision making process analysis. As the final goal of the policy is to increase the number of entrepreneurs in the sphere and the number of entrepreneurs is the sum of individual decisions to become an entrepreneur, the analysis of this decision process might be a useful instrument in policies planning. Decision Theory provides a framework, which assists in identifying the significant factors in decision making process. Decision making process analysis is devoted to identification of the impact of all decision determinants, taking into account peculiarities of the Decision Maker, information available and behavioural factors.

The next chapters of the paper will be focused on modelling the Policy Effect on Entrepreneurial Decision and creation of entrepreneurship determinants classification, which would be based on the Decision Maker's Gains perspective. The causality problem and importance of Decision Maker's perspective lead to application of Econometrical and Decision Theory frameworks.

3. POLICY EFFECT ON ENTREPRENEURIAL DECISION MODELING.

The previous chapter demonstrated that application of multidisciplinary approach (which would include Econometrical perspective on causality and Decision Theory) should be used in Policy Effect on Entrepreneurial Decision Modeling.

Econometrical Framework will ensure the classification applicability in policy effect assessment. Decision Theory framework would assist in Entrepreneurial Decision Modeling.

3.1 Econometrical Framework.

The Policy Maker is interested in predicting the effect of a certain action or policy on the level of entrepreneurship in the sphere of agriculture. In other words, the Policy Maker is interested in the causal effect of a certain action.

In econometrical terms, a causal effect can be presented in terms of a treatment effect:

$$\Delta_i = Y_i(1) - Y_i(0)$$

Where Δ_i is a treatment effect, $Y_i(1)$ is the outcome for a unit i (individual i) in case of treatment and $Y_i(0)$ is the outcome for a unit i (individual i) in case of no treatment.

The causal effect can be defined in terms of a treatment (D_i), Di = 1 means the treatment and Di = 0 means no treatment. For a unit i, the treatment D_i has a causal effect on the outcome Y_i if the event $D_i = 1$ instead of $D_i = 0$ implies $Y_i = Y_i(1)$, instead of $Y_i = Y_i(0)$ (Ichino, 2007). That means if the individual received treatment D, then $Y_i = Y_i(1)$, if the individual i hasn't received treatment D then $Y_i = Y_i(0)$.

The main difficulty in determining causality (the so-called fundamental problem of causal inference (Morgan, 2001)) is that it is impossible to observe for the same unit i the values Di = 1 and Di = 0 as well as the values Yi(1) and Yi(0) and, therefore, it is impossible to observe the effect of D on Y for unit i (Holland, 1986).

However, in an experimental design with random assignment to the treatment and control groups, we can apply the Average Treatment Effect Formula. Random assignment means that individuals are assigned randomly to the Treatment and Control Groups and there was no self-selection. Perfect randomisation also means compliance with the assignment (Ichino, 2007).

So under the assumption of perfect randomisation the expected effect of the treatment is equal to the difference between the expected outcome in case of treatment and the expected outcome in case of no treatment:

$$E\{\Delta_i\} = E\{Y_i(1)|D_i = 1\} - E\{Y_i(0)|D_i = 0\}$$

In other words, the individual level causal effect of the treatment can be presented as:

$$\delta_i = Y_i^t - Y_i^c$$

Where Y_i^t and Y_i^c are the treatment and control states respectively (Morgan, 2001).

The Policy Maker though would be interested in an estimator which would show the effect of a treatment on a group of population, what can be presented as a "Difference-in-mean" estimator of Average Treatment Effect:

$$ATE = \frac{1}{N_1}\sum_{i=1}^{N_1} y_{1,i} - \frac{1}{N_0}\sum_{i=1}^{N_0} y_{0,i}$$

The Average Treatment Effect shows the difference between the average outcome for the Treatment and Control Groups.

If we apply the Average Treatment Effect formula to entrepreneurial decision modeling, then $y_{1,i}$ would be the expected outcome for the individual *i* in case of treatment, while $y_{0,i}$ would be the outcome for the individual *i* in case of no treatment.

The key question in modeling the Effect of a Policy is the outcome variable y_i. The outcome variable can be presented as a binary, discrete or a continuous variable.

On the one hand, the decision of an individual to become an entrepreneur in the sphere of agriculture represents a choice between two options: to become or not to become entrepreneur in agriculture. If y_i is presented as a binary variable that would mean that the outcome is the decision of an individual to be an entrepreneur in a certain specific sphere or not to be:

$$y_i = \begin{cases} 1, if\ U_n > 0, \\ 0, if\ U_n \leq 0 \end{cases}$$

$$U_n = \beta \cdot s_n + \varepsilon_n$$

ε - standard normal error.

β is a set of coefficients, while s_n is a set of independent variables.

U_n is the utility which the decision maker receives from accepting an action, instead of not accepting.

In order to decide on whether the outcome variable should be presented as a binary choice mode, the conclusions of the Part I of the Thesis should be taken into account. Entrepreneurship in agriculture might be hereditary and non-hereditary, most of the policies, applied in order to promote agricultural entrepreneurship are devoted to hereditary agricultural activity, however the non-hereditary agricultural entrepreneurship was proven to be more effective, bringing capital, new technologies, knowledge, education and networks into the sphere. The Dissertation is focused on the non-hereditary entrepreneurship promotion. According to the FAO classification of farmers and entrepreneurs, presented in Part I, hereditary farmer mostly considers entrepreneurship in agriculture from the binary perspective: to be or not to be, due to what the most suitable model in case of the hereditary entrepreneurship is a binary model.

The non-hereditary potential entrepreneurs are not facing the same choice problem as farmers. Potential entrepreneurs often consider several alternatives, which might include career in a company and entrepreneurial career in one of the business spheres. Due to the decision context, a model with discrete outcome variable would model the Entrepreneurial Decision more accurately, as it would take into account the variety of alternatives, which the Decision Maker considers. If y_i would be presented as a discrete variable, it would take values from 1 to Q, meaning that the number of alternatives is Q. Q represents all career opportunities, which the potential entrepreneur considers. In that case an individual would choose an alternative q (entrepreneurial career in the sphere of Agriculture) if the value of this alternative would be evaluated as a greatest. That can be presented in the following formula:

$$y_i = q \; if \;\; V_{qi}^* = \max\{V_{1i}^*, V_{2i}^*, V_{3i}^* \dots, V_{Qi}^*\}$$

V_{qi}^* is the value of alternative q for individual i.

In that case the ATE will be calculated as a difference in the number of individuals who choose the option q. In other words, the variable, used in ATE calculation would be equal to 1 if $V_{qi}^* > V_{gi}^*, \forall g \neq q$. Where q is entrepreneurial career in agricultural sphere and g is any other career choice.

On the other hand, the treatment effect can be presented as a change in probability of choosing the option q:

$$\Delta^{ATE} = \Pr(Y_i^t = 1) - \Pr(Y_i^c = 1),$$

In this case, the Average Treatment Effect shows the change in probability of an individual choosing the option q (entrepreneurship in Agriculture) in case of Treatment and no Treatment (Aakvik, 2004).

In the experimental context, both approaches can be used. The experiment participant might be asked whether he/she would choose the entrepreneurial career in agricultural sphere or not. Or the experiment participant might be presented with a list of alternatives (which would represent different career opportunities) and will be asked to choose one of them.

The next step of the research would be the Decision Theory Framework application, which would assist in the Entrepreneurial Decision modeling.

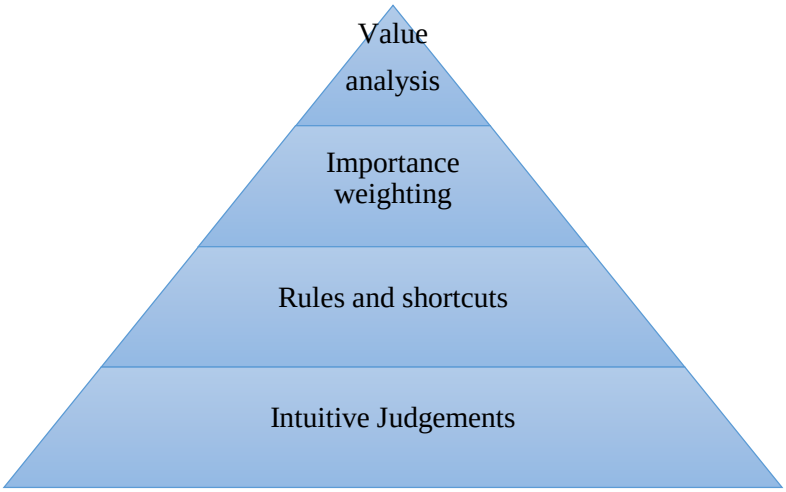
3.2 Decision Theory Framework.

Two types of models are constructed in Decision Analysis: descriptive and normative. Descriptive models show how people actually make decisions and normative show how people should make decisions (Phillips, 1984). The descriptive research analysis how people perceive uncertainties, the influence of biases on decisions, how do people cope with multiple conflicting objectives. The normative analysis removes all irrational aspects of decision making process and describes how idealised and perfectly rational decisions are made. The prescriptive analysis suggests how decision making process can be improved and how individuals can make better choses.

One of the important contributions of the Decision Analysis is identification and classification of decision making strategies, used by decision makers. Understanding differences of these strategies might assist in Entrepreneurial Decision modelling. The decision making process of an individual assumes the use of a certain approach, which can be simple or complex. Some people make intuitive decisions, and others use certain strategies unconsciously.

One of the classifications of decision strategies was suggested by Russo and Schoemaker (1993). It can be presented in a form of a hierarchy.

Scheme 2. Classification of the Decision Making Strategies by Russo and Shoemaker.



These four approaches to decision making range from intuitive to highly analytical (Russo, Shoemaer, 1993). Intuitive Judgements is the simplest approach when the decision maker makes a decision following his/her “internal voice”. “Internal voice” is intuition or the first

option, which comes to mind. In that case, the Decision Maker can't give logical explanation of his/her choice, he/she just "feels" that this decision would be better than the others.

Rules and Shortcuts represent a number of "rules of thumb" and defaults which are known to the Decision Maker and are used in order to decrease the time costs during the decision making process. "Rules of thumb" represent a great number of principles, ideas or beliefs, which are not necessary true. They help Decision Makers to make a decision with minimum time costs.

Importance weighting is a more complex approach when the Decision Maker considers several criteria and compares the importance of each of the criteria.

Value Analysis assumes a complex analysis of each of the alternative taking into account the importance of criteria and alternative performance on each of them. Value Analysis is the most complicated strategy, which can be applied by the Decision Maker. In case of Value Analysis the Decision Maker assigns importance to each of the criteria considered. He/she compares how alternatives perform under each of these criteria. Then he/she compares overall performance of alternatives taking into account the importance of each of the criteria.

The more complicated decision approaches point researchers attention to the importance of decision criteria. An individual considers criteria, on the base of which he/she should make a decision. Criteria are the factors, which are important for the Decision Maker. Taking into account existing criteria, the Decision Maker considers the alternatives, which show certain performance on each of the criteria chosen by the Decision Maker.

Four basic generic strategies, which can be applied in decision making process and which take into account decision criteria, were listed in the paper by Ranyard (2005).

Lexicographic rule: this generic decision strategy implies that the choice among alternatives is made in favour of an option, which is the best on the most important criterion.

For example if the most important criterion in a career choice is income and the Decision Maker is applying the Lexicographic rule, then the alternative which is expected to provide the highest income will be chosen by the Decision Maker. All the other criteria won't be taken into account. If one of the alternatives (let's say, entrepreneurship) will be better by all other criteria: will provide more freedom, would be more interesting, would provide better schedule etc, but it won't provide the highest expected income, then the alternative won't be chosen. Applying this approach, the Decision Maker is focused on maximizing one of the benefits.

Another approach, which the Decision Maker might apply, includes application of principle of satisfaction.

Satisficing rule: the Decision Maker identifies "good enough" values for all criteria and

chooses an option, which has the greatest number of "good enough" values.

Application of the satisficing principle assumes that the Decision Maker might consider more than one criterion (in contrast to the previous strategy). The Decision Maker might have a certain satisfying level of income, which he/she expects to receive from his/her career. If both entrepreneurship and career in a company will provide this minimum satisfying level of income, the Decision Maker considers other criteria, which might be flexible schedule, opportunity to create, etc. In this case if career in a company would provide greater income, but "opportunity to create" criterion won't be satisfied, then the Decision Maker would choose entrepreneurial alternative.

Elimination by aspect rule: the Decision Maker chooses the minimum acceptable value for all criteria and eliminates all the options with values lower than acceptable.

This strategy is similar to the previous Satisficing rule. The difference is that alternatives are evaluated in an opposite order. For example the Decision Maker first analyse more important criteria and eliminates the alternatives which don't provide the minimum satisfying level and then, if there is more than one alternative remaining, he/she considers less important criteria and checks, which alternatives don't achieve the minimum satisfying level.

Additive rule: According to this rule, the decision maker evaluates how each alternative performs on each of the criterion, giving it the values "plus", "zero" or "minus", and then sums up the results for each of the alternatives. The additive rule might become a more complicated strategy if Decision Maker assigns weights or importance to criteria. For example, the Decision Maker gives scores to alternatives performance under each of the criterion and then compares this scores taking into account that different criteria have different level of importance for the Decision Maker. Additive Rule is similar to Value Analysis in Schoemaker and Russo classification.

The decision making process includes psychological, logical, analytical and mathematical skills and peculiarities of the Decision Maker. Due to what, the strategies applied in decision process represent a greater number of approaches.

Another contribution of the Decision Analysis is the decision models, which are applied depending on the problem type. DA has seven model types, based on the decision problem type, which might be uncertainty or multiple criteria (Phillips, 1989).

Uncertainty is the situation which implies that possible outcomes of a decision are unkown as well as the probabilities of these outcomes. The difference between uncertainty and risk is that in case of risk possible outcomes are known as well as the probabilities of these outcomes.

As a result uncertainty demonstrate a more complex issue in decision making context. “A good decision cannot guarantee a good outcome. All real decisions are made under uncertainty.” (Edwards, 1984).

Multiple objectives is a situation with many options and multiple, conflicting objectives. In this situation the Decision Maker often needs to evaluates the importance of each of the criterion in order to choose between alternatives.

According to the classification, suggested by L.D. Phillips (1989), the seven model types based on the problem type can be presented as follows:

Table 2. Decision Models Based on Problem Type.

Uncertainty		**Multiple Objectives**
Extend conversation • Event tree • Fault tree	Choose option • Payoff matrix • Decision tree • Relevance/influence diagram	Evaluate options • Multi-Criteria Decision Analysis
Revise opinion • Bayesian nets • Bayesian statistics		Allocate resources • Multi-Criteria Common Dilemma
Separate into components • Credence composition • Risk analysis		Negotiations • Multi-Criteria Bargaining Analysis

Source: Phillips, L. D. (1989).

Bayesian nets are used in case of uncertainty problem in order to revise opinion of decision maker in case of information updates. In other words, bayesian networks are used for modeling beliefs and complex probabilistic interdependence between factors and events. The term "Bayesian networks" was created in order to stress three aspects: subjective nature of the information, reliance on Bayes' conditioning when receiving new information and distinction between causal and evidential modes of reasoning (Pearl, 2000). The computer softwares, which apply Bayes Theorem, calculate conditional probabilities for belief networks and updates with every new information.

Decision trees are applied when the probabilities of possible decision outcomes can be calculated or assumed. A decision tree represents a tree-like graph with three types of nodes: decision nodes which are points in which individual should make a decision, chance nodes which determine probabilities and terminal nodes which identify the possible outcomes.

Multi-Criteria Decision Analysis is applied in case of multiple competing objectives of the

Decision Maker. The Decision Maker identifies the possible options which he/she considers as alternatives, the list of criteria and the importance of each of the criterion in order to calculate the performance of each of the alternative. Each alternative receives a final score which can be calculated as a sum of performance of the alternative under each of the criterion, multiplied by the criterion weight.

The other models, which can be classified by the type of decision problem are: Fault tree, Bayesian statistics, Credence decomposition and Risk analysis which are focused on uncertainty problem and Multi-Criteria Common Dilemma and Multi-Criteria Bargaining Analysis which are used in case of multiple objectives issue.

The Multi-Criteria Decision Analysis (MCDA) is an extension of Decision Theory, which is focused on decisions with multiple objectives. Before its appearance the Decision Theory was mainly focused on decision trees and modelling uncertainty (Phillips, L.D. 2005).

Multi-criteria utility & value calculus for modelling multiple objectives & trade-offs evolved from the Decision Theory with Ramsey (1931) and von Neumann & Morgenstern (1947) as some of the main contributors. Multi-Criteria Decision Theory was created by Keeney & Raiffa (1976) and can be described by the formula:

$$V_i = \sum_{j \epsilon J} w_j \, v_{i,j,} \; \sum_{j=1}^{J} w_j = 1$$

Where the value V of an alternative i is calculated as a sum of the alternative scores on each criterion v_j multiplied by w which is a scaling constant that equates units of value. *J* is an index set of criteria. The total sum of criteria importance is equal to 1, which means that the importance of each of the criterion has a value from 0 to 1.

The Entrepreneurial Decision is often connected with multiple and competing objectives, such as financial and non-financial benefits: income vs free time, prestigious position vs self-realisation, etc. In the context of Entrepreneurial Decision MCDA might appear a suitable approach in decision modeling.

3.3 Policy Effect on Entrepreneurial Decision Model.

The goal of the Paper is to model the Policy Effect on Entrepreneurial Decision. The created model and decision criteria classification will be used in Part III in experiment conduction. The model should meet two main requirements: it should correspond to the real decision making

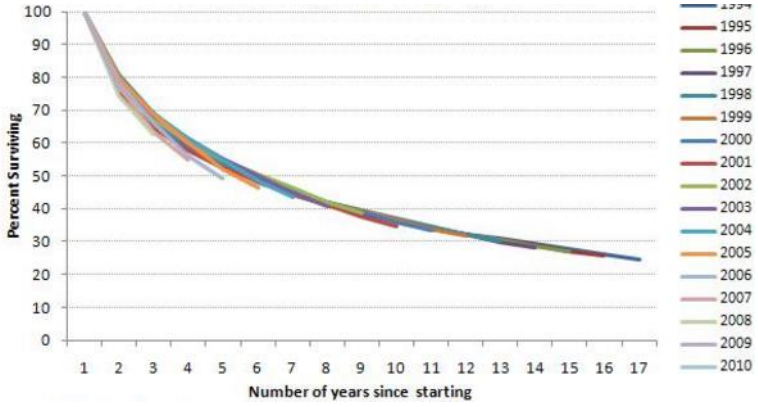
process of an individual who is considering entrepreneurial career in agriculture as one of the career alternatives. Secondly, the model applied in experiment should show the effects of a treatment with a maximum accuracy.

The previous Chapter presented different decision strategies and models, varying in complexity and decision context. The Entrepreneurial Decision modeling assumes modeling a career choice, when the Decision Maker is choosing between career in a company and entrepreneurial career in one of the spheres or industries which he/she is considering.

From the strategies and approaches, discussed previously, Intuitive Guess and Rules of Thumb strategies (presented in the Russo and Shoemaker classification) are definitely not applicable in the Entrepreneurial Decision, as the decision to become entrepreneur is an important, long-term decision which is made after consideration of a variety of factors and criteria and often after conduction of necessary calculations and research. The two more complex strategies, Importance Weighting and Value Analysis might be used by the Decision Maker as he/she might consider different importance of the criteria, which are significant in his decision. Lexicographic rule might be used by the Decision Maker if for him/her the income, for example, is the main and most important criterion. Satisficing rule also can be used by the potential entrepreneur. He/she might be not satisfied by his current career and he/she might have a number of demands, which he/she is willing to satisfy, such as acceptable income, satisfying level of self-realisation and a bigger freedom in work environment and schedule. Elimination by Aspect rule is also possible in the entrepreneur's decision strategy as the approach is very similar to the Satisficing rule. Additive rule has chances to be applied by the Decision Maker who builds his/her decision based on several criteria.

The decision context of a potential entrepreneur contains both types of decision making problems, described in the previous chapter, which are competing goals and uncertainty. The problem of competing goals is presented in existing literature on entrepreneurship. "Why entrepreneurs choose freedom over money" (2013) is one of such examples. Schumpeter mentions such reasons of entrepreneurial career choice as "willingness to found a private kingdom, to conquer, desire to prove superior to others as well as joy of creation". The uncertainty problem is also a significant issue in case of entrepreneurship. One of the most obvious indicators of high uncertainty of an entrepreneurial career is the survival rate of the newly established companies during the first years of operation.

Picture 1. Survival Rates of Establishments by Number of Years Since Starting, 1994-2010.



Source: U.S. Bureau of Labor and Statistics.

As we can see from the Chart: "Survival rates of establishments" the percent of the survived companies during first three years of operation is lower than 60%.

According to the Behavioral Economics and Decision Theory literature, one of the reasons of entrepreneurial career choice is overoptimism and overconfidence. *Overoptimism,* is the overestimation of probability of success, and *overconfidence* is the underestimation of variation of outcomes (Cooper, Woo and Dunkelberg, 1988). Overoptimism and overconfidence significantly increase the perceived probability of success in case of entreprenerial career.

As a result the Entrepreneurial Decision model should include both decision issues: the competing criteria and the uncertainty as well as its biased perception.

The Entrepreneurial Decision model would be based on the MCDA model, in which the value or attractiveness of alternative is evaluated based on added value approach:

$$V_i = \sum_{j \epsilon J} w_j \, v_{i,j,}$$

The MCDA represents the most suitable approach to entrepreneurial decision modelling as it takes into account more sophisticated decision strategies (Value Analysis, Importance Weighting), which can be applied by the decision maker and which are more probable in case of a career choice; also entrepreneurial decision often assumes consideration of several criteria,

which might have different level of importance for the decision maker, what again makes the MCDA approach suitable for entrepreneurial decision modelling.

The uncertainty problem might be added to the multi-criteria model as possible outcomes of each of the alternatives multiplied by the scenarios probabilities. The approach which allows the comparison of risky outcomes is Multiple Attribute Utility Theory with Keeney and Raiffa (1976) as some of the main contributors to the field. The Theory assumes computation of expected utility. The expected utility of an alternative can be presented as $E_j(u) = \int p_j(x)u(x)dx$ (Keeney, 1982) or it can be presented as $U(x) = \sum w_i[u_i(x_i)]$, where $u_i(x_i) = \sum_j p_{i,j}u_i(x_{i,j})$, $p_{i,j}$ is the probability of scenario *j*. (de Montis, 2005).

If we transform the formula in order to receive the expected performance of alternative *i* under criterion *j*, we'll receive the following: $v_{i,j,}$ which is the performance of a certain alternative by one of the criteria, might be calculated as:

$$v_{i,j,} = \sum_{l=1}^{L} p_l a_{l,i,j}$$

$a_{l,i,j}$ – is the performance of alternative *i* under criterion *j* in case of scenario *l*, p_l is the probability of scenario *l*.

According to the Lexicografic rule, the Decision Maker chooses the alternative which demostrates the best performance under the most important criterion. This approach might be used by the potential entrepreneur, if, for example, the only criterion which is important for him in his career choice is Income. In that case, if the model will be used in experiment, the application of Lexicografic rule by the Decision Maker will be seen from the experiment results: let's assume the Decision Maker would be presented with a list of criteria which include income (he applies Lexicografic rule and maximises income), than he/she would assign criterion weight equal to 1 to the Income criterion and zero to all other criteria.

The Decision Maker might also apply Satisficing or Elimination by Aspect rules, which means that he/she has a certain minimum level of criteria, which he/she wants to achieve. This approach to career choice is also possible and in order to include it in the model, a constraint, presented as follows, would be added:

$$v_{i,j} \geq m_j$$

What means that the value of an alternative *i* under criterion *j* should be not less than a certain minimum level m_j (assigned for the criterion *j*).

The important aspect of this model is the fact that the income from the entreprenerial activity

is not necessary compared to the wage as in basic career choice models. The model includes all possible decision making strategies of an individual. If the decision is made only on the base of the income, then the weight of this criterion is equal to 1. If the Decision Maker is considering also non-pecuniary criteria and the importance of non-pecuniary benefits of entrepreneurship might outweight the importance of the income difference (if the difference is in favor of the company career), then the condition of a minimum income is applied.

The next step is the inclusion of subjective and biased perceptions of the entrepreneurial sphere.

In Ocupational Choice problem individual's perception of alternative performance on each of the criterion is subjective and often biased. The individual knowledge about industries is limited, the Decision Maker might not know about certain opportunities, which the industry and market can provide. The Decision Maker might have a limited knowledge about infrustructure, subsidies, governmental programs, networks and other opportunities due to what the perceived performance of an alternative might be biased. If, for example, the wage, related to a certain job, can be known by the potential entrepreneur, the future income from entrepreneurship activity as well as the non-pecuniary benefits can be assessed unobjectively, what can be presented as follows:

$$v_{i,j} \neq v^*_{i,j}$$

$v^*_{i,j}$ is the real future performance of an alternative *i* under criterion *j*. $v^*_{i,j}$ is not equal to the perceived $v_{i,j}$. If the Decision Maker considers only one criterion which is income ($v_{i,1}$), and the alternative "entrepreneurship" is alternative *i*=1, while alternative "work" is *i*=2 then this situation can be presented as:

$$v_{1,1} \neq v^*_{1,1}, \text{ while}$$

$$v_{2,1} = v^*_{2,1}$$

Which means that the future wage might be known, while potential future income from entrepreneurship is not known.

Another important aspect is that the importance of each of the criterion w_j is different for each individual. We can model it as the importance of a criterion *j* for individual *e* is not equal to importance of criterion *j* for individual *f* for any *e* different from *f*:

$$w_{e,j} \neq w_{f,j} \quad \forall e \neq f$$

This condition would play an important role in Part III experiment as it would allow to

identify the difference in criteria importance among experiment participants who are more attracted to the agricultural sphere and who are attracted to other industries.

To sum up, the model of potential entrepreneur's decision making process is based on the Multi Criteria Decision Analysis Model $V_i = \sum_{j\epsilon J} w_j v_{i,j,} \ \sum_{j=1}^{J} w_j = 1$ where the utility or the value of an alternative i can be calculated as a sum of its performance v_j on each of the criteria j multiplied by the weight of each of the criterion w_j. The Decision Maker might have a minimum level on certain criterion or criteria, what is modeled as $v_{i,j} \geq m_j$. This condition appeared due to two reasons: firstly, because this condition brings together several possible approaches to gains: satisfaction and maximisation, satisfaction means that the value should be not less then a certain minimal level, however if the maximisation approach is used instead then the value of the criterion w_j would be given the highest possible value. Another way of explaning the condition $v_{i,j} \geq m_j$, applied specifically to criterion Income is the Maslow hierarchy of needs (which would be discused further in the Paper) according to which the higher, non-pecuniary needs can't be satisfied if the lower physiological needs are not satisfied, and the physiological needs assume the minimum satisfycing level of income. The model also takes into account assumed probabilities of different scenarios l=1…L, which provide different values to the alternatives $v_{i,j,} = \sum_{l=1}^{L} p_l a_{l,i,j}$. The model includes difference in criteria importance among decision makers: $w_{e,j} \neq w_{f,j} \quad \forall e \neq f$, and subjective perception of alternatives performance $v_i \neq v_i^*$.

The model evaluates the attractiveness of the agricultural sphere of entrepreneurship, which can be influenced by certain policy or treatment.

As it was concluded in the previous chapters the Average Treatment Effect can be presented by the following formula: $ATE = \frac{1}{N_1} \sum_{i=1}^{N_1} y_{1,i} - \frac{1}{N_0} \sum_{i=1}^{N_0} y_{0,i}$, where y_i can be calculated as a binary variable: $y_i = 1, if\ U_n > 0,\ y_i = 0\ if\ U_n \leq 0$. The outcome variable can also be presented as a discrete variable equal to q, if the q is the alternative with the highest value. In that case, $y_i = q\ if\ V_{qi}^* = \max\{V_{1i}^*, V_{2i}^*, V_{3i}^* \dots, V_{Qi}^*\}$. In case of a discrete outcome variable the Average Treatment Effect might be presented as a change in probability of an individual choosing the option 1 (entrepreneurship in agriculture) in case of treatment and no treatment: $\Delta^{ATE} = \Pr(Y_i^t = 1) - \Pr(Y_i^c = 1)$. Or y_i can be transformed into a binary: $y_i = 1\ if\ V_{qi}^* = \max\{V_{1i}^*, V_{2i}^*, V_{3i}^* \dots, V_{Qi}^*\}$ and $y_i = 0\ if\ V_{qi}^* \neq \max\{V_{1i}^*, V_{2i}^*, V_{3i}^* \dots, V_{Qi}^*\}$.

Decision Theory, suggests another view on y_i, which can be the score or value which the Decision Maker assigns to the alternative. In that case, the outcome variable is evaluated as a continuous variable. The outcome variable is the level of Attractiveness of the agricultural sphere, which can be calculated applying the MCDA formula $V_i = \sum_{j\epsilon J} w_j \, v_{i,j,}$.

So the outcome variable will have value from 0 to 100: $y_q = 0, \dots 100,$ y_q is attractiveness of alternative q.

In that case, the model would show not the decision of an individual, but the score, which he/she gives to a certain decision alternative. This approach is applicable in an experimental design. But why would the Policy Maker be interested in a score or the value of the alternative instead of the final decision? The answer is simple. An experiment devoted to analysis of the policy effect might show an increase in the number of individuals who choose the entrepreneurial sphere, which the Policy Maker is promoting. However, this change in number, which is influenced by one factor, might be considerably small. The treatment might only increase the attractiveness of the sphere and in that case, the effect of several treatments might significantly increase the total number of decisions in favor of the promoted alternative.

Therefore, the increase in attractiveness of an alternative might be a useful information for the Policy Maker. The Average Treatment Effect would show a change in the Average attractiveness of the agricultural sphere of entrepreneurship. If the change in attractiveness would be statistically significant, the approach to promotion of the sphere, used in the experiment, might be considered with a greater attention. The increase in the level of attractiveness as an indicator of a policy effect might be applied in an experiment on potential entrepreneurs, in other words on people who are considering entrepreneurial career.

As a result the model can be presented as follows.

In the ATE formula i stands for individual i, while in the MCDA model i stands for alternative i. I'll substitute i, which stands for alternative by a, so the list of alternatives would be presented as a = 1,… A.

$$ATE = \frac{1}{N_1}\sum_{i=1}^{N_1} y_{1,i} - \frac{1}{N_0}\sum_{i=1}^{N_0} y_{0,i}$$

1) $y_i = 1 \; if \; V_{qi}^* = max\{V_{1i}^*, V_{2i}^*, V_{3i}^* \dots, V_{Ai}^*\}$ *and* $y_i = 0$ *otherwise, q – sphere of agriculture.*

or

2) $y_{i,a} = V_{i,a}$ *which means that the outcome variable for individual i and alternative a is equal to the attractiveness score assigned by individual i to alternative a. The ATE is calculated*

for one of the alternatives, in this case for the sphere of agriculture.

The value of alternative "agriculture" is calculated as follows:

$$V_a = \sum_{j \epsilon J} w_j \, v_{a,j,} \qquad \begin{cases} v_{a,j} \geq m_j \\ v_{a,j} = \sum_{l=1}^{L} p_l a_{l,a,j} \\ v_{a,j} \neq v_{a,j}^* \\ w_{e,j} \neq w_{f,j} \quad \forall e \neq f \end{cases}$$

3.4 Model Conclusions.

The potential entrepreneur makes a decision concerning entering the entrepreneurial sphere according to a number of criteria and their importance for him/her as a Decision Maker.

The Policy Maker plans approaches for entrepreneurship in Agriculture promotion. The sum of all approaches applied can be called promotion strategy. The Policy Maker should have sufficient information on the possible effect of each approach, in this case the model of Treatment Effect on Entrepreneurial Decision can be useful due to a number of reasons.

It provides more information about the approach effect as the change in outcome variable might represent a change in the level of Agricultural sphere overall Attractiveness.

The Treatment Effect assumes that the outcome variable might be binary, discrete or continuous. As it was mentioned in the previous chapters, binary variable is applicable in case of hereditary agricultural activity, while in case of non-hereditary potential entrepreneurial career in the sphere of agriculture, the outcome variable y_i might be discrete (which can be transformed into binary) or continuous. Econometrical approaches mostly consider y_i as a discrete variable, which is the choice between several alternatives according to the highest value. Decision Theory, in contrast, assumes application of a continuous variable as an evaluated outcome, which would be a level of attractiveness of an alternative from 0 to 100, evaluated by the Decision Maker. The continuous outcome variable in ATE assessment might be a useful instrument in experiments, devoted to assessment of a certain policy effect.

The first conclusion on model is that the expected income from entrepreneurship is not necessarily compared to the wage. This fact emphasizes the importance of other factors consideration in entrepreneurship promotion. Existence of non-pecuniary factors should be also taken into account by the Policy Makers.

Existence of a minimum income is another factor, which should be considered. The expected profits from entrepreneurship is not necessary compared with the wage, but it is most probably compared with a certain minimum level, which adds a new perspective on entrepreneurship in agriculture. The Decision Maker pursues either maximization of income or an achievement of a satisficing level.

$v_{a,j} \neq v^*_{a,j}$ means that the expected gains from entrepreneurship is in many cases not equal to the real future gains. According to the Behavioral Economics literature on entrepreneurship, expected income from entrepreneurship is often overestimated due to overconfidence and overoptimism. Another reason of biased gains assessment is the problem of limited knowledge about the industry opportunities and benefits. Certain activities of the Policy Maker should be devoted to informing the population and potential entrepreneurs about the market potential.

$w_{e,j} \neq w_{f,j}$ is another important aspect of the model. The importance of each of the criteria is different for each individual, which means that the Policy Maker should take into account different factors which influence the decision making process of a potential entrepreneur as the importance of factors are different for different individuals. The difference in importance stresses the complexity in Policy Effect assessment and provides reasoning for further research devoted to analysis of criteria importance for different groups of entrepreneurs.

The model, which provides significant information about potential entrepreneurs, doesn't specify the list of criteria, which the decision maker takes into account. The next paragraph will be devoted to identification of this list of factors.

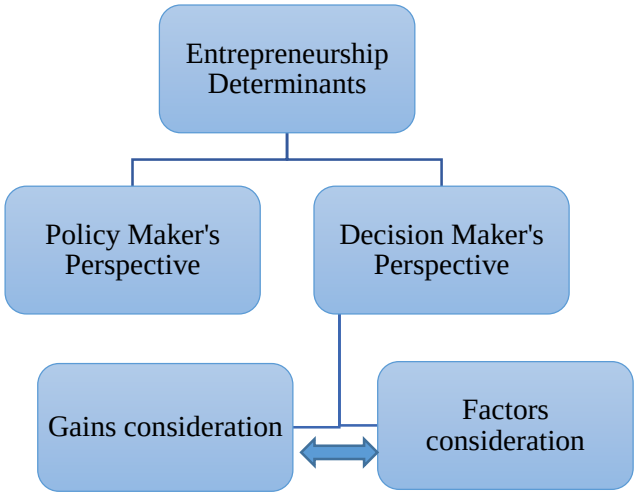
4. NEW CLASSIFICATION OF ENTREPRENEURIAL DECISION CRITERIA.

In the previous chapter, the Policy Effect on Entrepreneurial Decision model on the base of Decision Theory was created. The decision model includes criteria $v_{i,j,}$ and their importance $w_{j,}$. The remaining question is what are these factors $v_{i,j,}$ and whether an exhaustive

classification of these factors might be created. The model is based on the Decision Analysis approach MCDA, according to which Decision Maker chooses his own list of criteria. However, in order to apply the model in experimental design a universal classification of criteria, applicable in Entrepreneurial Decision, should be created.

If we come back to the Entrepreneurship Determinants classifications scheme, created in the previous chapter, we'll see that the Decision Maker's perspective assumes two possible classifications of determinants: Gains an Factors.

Scheme 3. Entrepreneurship Determinants classification scheme.



The Factors include all the factors, which determine expected future gains of the Decision Maker. Gains can be considered as decision criteria in the model as they represent the list of benefits, which influence the potential entrepreneur's decision.

The goal of this part of the Paper is to create a classification of these criteria, which would provide a unified framework applicable in an experiment.

According to Keeney and Raiffa (1976) a good set of criteria should be:

- complete (cover all objectives of the Decision Maker),
- operational (criteria should be meaningful),
- decomposable (criteria don't depend on each other),
- mutually exclusive,
- of minimum size.

Due to strong interconnection between gains and factors, the influence of factors on gains would be also modeled.

The new classification should be complete and exhaustive, due to what the main principles of the new classification development are:

1. The classification should include both financial and non-financial criteria of the Decision Maker, based on the Part I conclusions.
2. Taking into account existing classifications and checking whether the new classification includes all the factors, mentioned in the existing approaches.
3. The new classification should be based on more generic instruments, which are focused on covering all the needs of an individual who consider different career opportunities.
4. The new classification will be based on both top-down and bottom-up approaches. The basic approaches (SWOT and Maslow hierarchy of needs) will be applied to entrepreneurial and career needs.
5. Ability of the new classification to cover all the possible criteria, considered by the Decision Maker, will be checked.

The approach which is often used in psychology and which is considered as the methodology that covers all human's needs is the so-called Maslow hierarchy of needs. The Maslow hierarchy of needs was applied in this research in order to identify all possible needs of the Decision Maker, applicable to Entrepreneurial Decision. The Maslow hierarchy of needs will be used in order to create a classification of gains, which the entrepreneur expects to receive.

The second approach, which was used, is the SWOT (strengths, weaknesses, opportunities and threats) analysis. SWOT is an instrument commonly used in business plans analysis and is considered as a convenient approach which covers all factors needed for the business or entrepreneur's decision. The SWOT analysis is the best approach to analyse the factors, which the Decision Maker considers in order to determine future gains.

The classification of non-pecuniary determinants was tested by applying a real life 120 entrepreneurs interviews, which stated their reasons of being entrepreneurs.

4.1 Theoretical Framework.

The two generic approaches which were used in the new classification are the SWOT analysis and the Maslow Hierarchy of Needs.

SWOT illustrates decision-making process of an individual, who analyses pros and cons before starting a project or business. The methodology is often used in entrepreneurial projects planning, what determines it's high utility for the research.

The SWOT includes analysis of internal factors: Strengths and Weaknesses, and external factors: Opportunities and Threats.

Table 3. SWOT Analysis Table.

	SWOT	
Internal factors	Strengths	Weaknesses
External factors	Opportunities	Threats

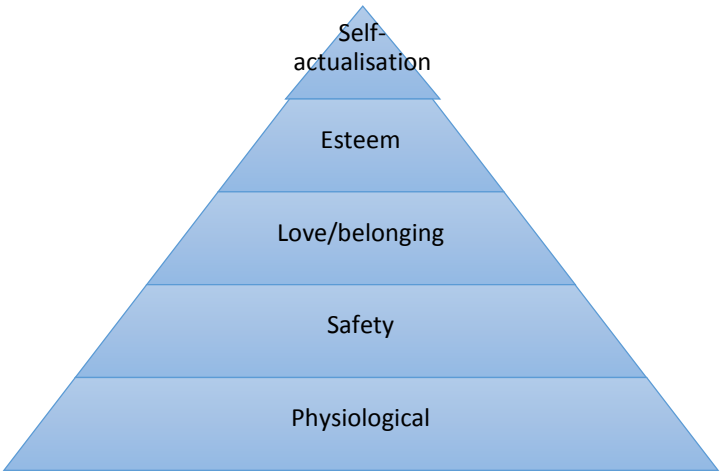
The key difference between these two groups of factors is that for two individuals who may enter a certain business in the same area the external factors are the same, while internal factors are different. The Decision Maker often combines strengths and opportunities, threats and strengths in order to receive more information about the potential of a certain business opportunity.

The reason of SWOT analysis application is the fact that the SWOT approach to analysis is applied in business plan assessment, a new potential business project is analysed by the Decision Maker from the point of view of these four elements (strengths, weaknesses, opportunities and threats). Taking into account the duality of the Decision Maker's choice process, which (as it was mentioned in the previous parts of the Paper) includes two perspectives: factors perspective and gains perspective, the SWOT analysis is an approach which is closest to the decision making process based on the factors analysis.

Applying Decision Theory, we can conclude that the external factors might be perceived differently by different individuals. Another important issue is that the knowledge about external factors is always limited. According to the Decision Theory (even if the conditions of the market imply good opportunities for the potential entrepreneurs), lack of knowledge about market conditions might be a serious reason of a limited number of entrepreneurs in the sphere.

The Maslow's hierarchy was proposed in 1943, it represents a classification which was often used in psychological research as a scheme which covers most of the human's common needs with basic needs such as physiological and safety and higher level needs, such as love and belonging as well as esteem and self-actualization.

Scheme 4. Maslow's Pyramid of Needs.



The original hierarchy contains five levels of needs: the physiological needs assumes all the basic needs essential for survival, such as food, drink, air, warmth, sleep. Safety need is the need to be safe, secure and protected. It includes the governmental regulations, etc. All the higher level needs can be fulfilled only if these two basic needs are satisfied. The need for love and belonging includes the need for friendship, love, affection. Esteem needs includes two levels of needs: to be respected, valued, admired by other people and to have a feeling of self-respect. Actualisation is the highest need, which includes self-realisation.

In Maslow's later works (1970), three new needs appeared which were cognitive need (need for knowledge, etc.), aesthetic need (need for beauty) and transcendence need which is an altruistic need. The Maslow approach is still a popular framework for research in the sphere of sociology, psychology and management (Kremer 2013).

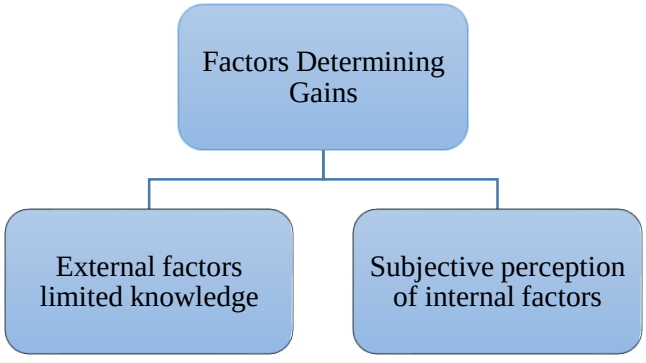
The main reason of the Maslow's hierarchy application is its universality. The hierarchy is supposed to cover all human's needs, what makes it an effective instrument in case of top down classification creation. Starting from the human's needs, which include pecuniary and non-pecuniary gains, the hierarchy will be applied to the specific sphere of Entrepreneurial Decision. Then on the base of the existing literature on entrepreneurship and career incentives, the new classification will be developed.

4.2 Criteria Classification.

Taking into account the SWOT Analysis, the career determinants can be divided into external and internal. In case of entrepreneurship career consideration, the Decision Makers often follow SWOT analysis approach either directly or intuitively. The DM considers his strong and weak points: his knowledge, skills, assets, connections; on the other hand, he considers the external factors such as market opportunities, regulations, risks and threats. In case of a career in a company, the SWOT analysis is less applicable, as the DM doesn't need to make a detailed analysis of the internal factors: he/she sends his CV to the company and he is either accepted or not. Also he/she doesn't need to make a detailed analysis of external factors, as the work place conditions are often fully described by the employer. As a consequence the classification of determining factors would be applicable if the Decision Maker is making a choice between several entrepreneurial opportunities.

The Decision Theory adds an important concept of perception of the factors, which includes limited knowledge of external determinants (limited knowledge of market opportunities, laws, financial opportunities, grants, new technologies, etc.) and biased perception of internal factors (due to overoptimism and overconfidence potential entrepreneurs overestimate their future income and chances to succeed). The potential entrepreneur makes a final decision on the base of the future benefits (according to the Decision Theory and neoclassical approach, which applies the utility analysis). The expected benefits depend on the perceived external and internal factors.

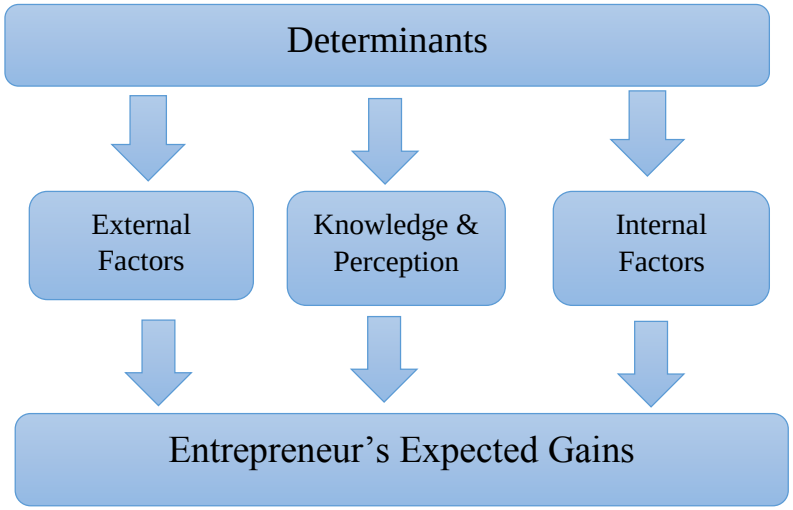
Scheme 5. Factors Determining Gains.



The gains, which the Decision Maker expects to receive from his choice, determine the final decision of an individual to become an entrepreneur in a certain sphere. The expected gains evolve from the analysis of factors, which are limited knowledge of external factors and subjective perception of internal factors. The influence of these factors on gains might be

demonstrated in a scheme:

Scheme 6. Influence of Factors on Perceived Future Gains.



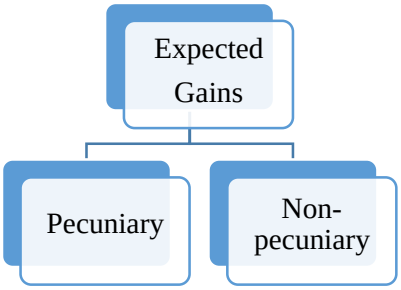
The next step of the Paper is to create the classification of Gains, on the base of existing literature and Maslow Hierarchy of Needs.

Expected Gains as a group of factors can be dividing into two subgroups: pecuniary and non-pecuniary factors.

The two groups (pecuniary and non-pecuniary factors) represent criteria groups, which determine career choice both in case of entrepreneurial career and career in a company. Distinguishing gains as financial and non-financial refers to a common approach in organisational behavior, which considers separately financial and non-financial ways of employees motivation. According to M. Dewhurst et al (2009) dividing incentives to financial and non-financial, and a special focus on non-financial benefits is an unavoidable step in motivation increase. According to the article, "nonfinancial incentives are even more effective motivators than the highest-rated financial incentives".

Sullivan (2006) also divides the entrepreneurial benefits to the financial and non-financial, as it was shown in the previous chapters. Hurst and Pugsley (2010) also show that majority of small business owners report that non-financial benefits.

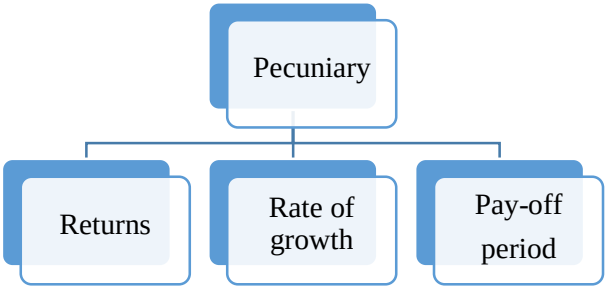
Scheme 7. Expected Gains.



However, if the pecuniary gains are divided into components, they would be different for entrepreneurial careers and career in a company.

Pecuniary or financial gains in case of entrepreneurship, include three elements: *expected returns*, *rate of income growth* and *the period of investments pay off*. The three main elements of business financial gains were identified through the existing business literature analysis (French, 1989), (Williams, 2012).

Scheme 8. Pecuniary Factors in Case of Entrepreneurial Career.



However, in contrast to the entrepreneurial career financial benefits, career in a company assumes different pecuniary benefits, such as salary, bonuses and growth opportunities.

The list of pecuniary factors can be applied in an experiment if only entrepreneurial alternatives are considered.

The non-pecuniary benefits represent a more complex sphere of modelling and analysis due to the lack of research and absence of existing classification of non-financial entrepreneurial benefits.

The classification should be applicable in career alternatives comparison. It should contain groups of potential non-pecuniary gains, which are mutual for different individuals. So the classification should be based on a generic approach, such as the Maslow hierarchy of needs.

The Decision Theory also represents a significant instrument in non-financial gains

classification creation as the Theory considers non-pecuniary motivation of the decision makers and models the decision making process.

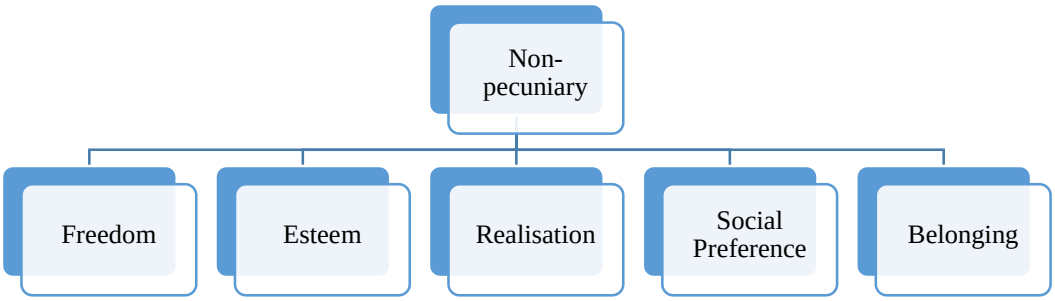
The non-financial benefits of entrepreneurship as well as non-pecuniary incentives in case of a career in a company were considered in a variety of articles and one of the difficulties in a non-pecuniary benefits classification creation is that these two groups of benefits (entrepreneurial and career based) represent two diverse groups: articles on entrepreneurship often mention freedom as one of the key benefits ("Why entrepreneurs choose freedom over money" (2013), "Entrepreneurship is a basic freedom"), while articles on non-pecuniary benefits at work focus on such factors as recognition and appreciation (Long, 2010). However, the nature of gains, from the point of view of the human's needs might be the same. This is another reason to apply Maslow Hierarchy of Needs.

As it was mentioned earlier, Maslow's Hierarchy includes the Safety and Physiological needs at the bottom of the pyramid. These two levels of needs represent the pecuniary factors as financial benefits are spent firstly on physiological needs and safety.

The higher level needs by Maslow represent non-pecuniary needs of Love & Belonging, Esteem and Self-Actualisation. "Freedom" as a need belongs to the "Esteem" group, however in this research "Freedom" will be considered as a separate group of needs, as freedom in entrepreneurship represents a cluster of motivating factors, which was considered in a number of researches, such as "Why entrepreneurs choose freedom over money" (2013), "Entrepreneurship is a basic freedom" (2014), etc. Esteem, self-actualisation and freedom considered separately, and Social Factors (which appeared as a separate need in Maslow's later works) can form a relatively complete list of non-pecuniary criteria - determinants of entrepreneurship. The love seems not to relate to entrepreneurial activity, however belonging might be. Belonging to the entrepreneurial society, to the family in a family business might be related to this cluster of needs. "Why Belonging Is Key in Today's Workplace", "Culture of Belonging Help Boost Productivity" are some of the articles, which point attention to Belonging as a separate non-pecuniary criterion.

The five groups of non-pecuniary criteria, which were identified using the existing literature analysis and Maslow Hierarchy can be presented as follows:

Scheme 9. Non-pecuniary Criteria in Entrepreneurial Decision (Entrepreneurship Determinants Classification).



Freedom.

Freedom as a gain includes freedom in schedule, choosing the sphere of business, choosing the plan of development, time flexibility, freedom to make decisions, etc. Comparison between entrepreneurial career and career in a company often assumes that entrepreneurial alternative provides greater freedom. Articles on entrepreneurship (Shane, 2013) and on employees motivation (Kolok, 2014, Pitt Watson, 2014) mention freedom as an important criterion.

Esteem.

Esteem includes desire to be respected, accepted by others. Be recognised and valued.

Maslow considers "lower" and "higher" versions of this need. The "lower" represents a desire for recognition by other people, while "higher" represents the need for self-respect. Freedom applies to the "higher" esteem need according to Maslow, however due to a great importance of "Freedom" as a non-financial benefit of entrepreneurship, freedom is considered as a separate non-financial gain.

Realisation.

Self actualisation in Maslow's hierarchy means full realisation of individual's potential. The concept of self-actualisation received high attention lately and is often promoted by companies to their potential employees (Jackson, 2002).

Social Preferences.

Self-transcendence, which is the need for altruism and helping others appeared in later works by Maslow (1970). This concept is considered as Social Preference in this paper and includes contribution to the world and society wellbeing, helping others, protecting the environment, helping certain social groups, giving to charity and non-governmental organisations. Social Preference is studied in behavioral and experimental economics. Behavioral Economics pays particular attention to the concept and its importance in individual's behavior. Social preference

is a crucial aspect of business activity and entrepreneurship. The principle of the so-called "sustainability" in organisation's and business functioning receives a great attention nowadays (Leisinger, 2015). "Sustainability" assumes taking care of the environment and society needs, what implies that social preference should be an important value in entrepreneur's activity. Also, as the principle of sustainability is cultivated globally and corporations often include it to the list of their priorities (the list of such companies include Coca-Cola, Adidas, Shell and many others), Social Preference might play a significant role in company's employee career choice.

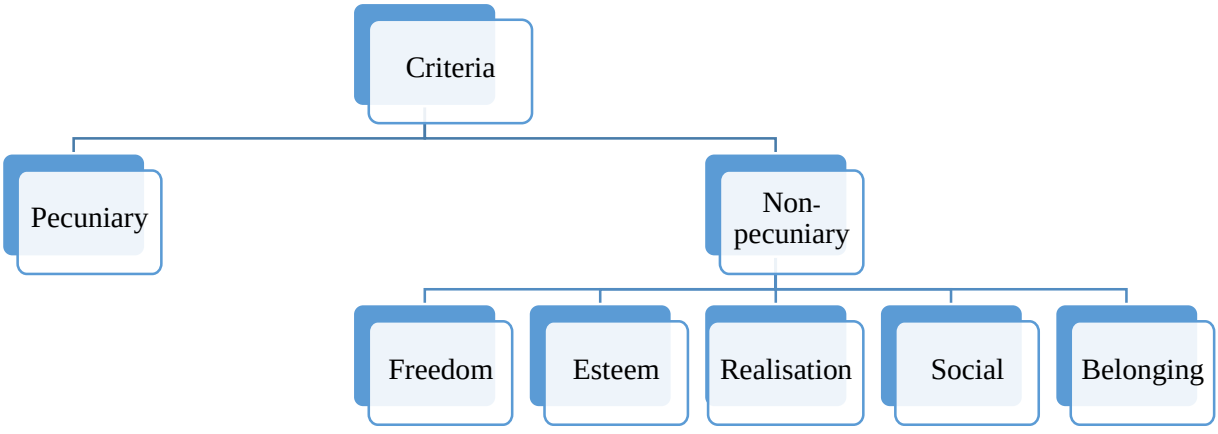
Belonging.

As it was already mentioned, Belonging as a need includes belonging to entrepreneurial society, different networks, teams and organisations as well as to an entrepreneurial society. The Belonging factor appeared from the Maslow's third level need of "Love or belonging" (Maslow, 1943). According to Maslow "Love and belonging" includes friendship and relationships at work group. I made the group "Belonging" wider, including belonging to certain social groups, such as entrepreneurial society, certain particular business sphere society, entrepreneurial clubs, etc.

The Safety need wasn't included into the classification, as the need can be referred to both pecuniary benefits (in form of a pure financial savings, for example) and non-pecuniary benefits (in form of a feeling of safety and security). In this model we'll refer the safety criterion to the group of pecuniary factors, as in Maslow Hierarchy Safety need is considered as a basic need.

As a result, the full list of criteria (applicable in a career decision, which assumes consideration of both entrepreneurial opportunities and work in a company) can be presented as:

Scheme 10. Entrepreneurial Decision Criteria.



4.3 Classification Check Survey.

The next task of the Paper is to check whether the created classification covers the majority of possible criteria in Entrepreneurial Decision and can be applied in experiment. The experiment, which would be conducted in Part III of the Dissertation, will use the list of criteria, what assumes utilisation of an approach based on the MCDA methodology. Empirical studies showed that "different lists of criteria can result in significantly different ranking of alternatives" (Hobbs and Meier 2000). According to Malczewski and Rinner (2015), the list of criteria can be based on one of two possible approaches. In case of first approach, the list of attributes is made in such a way that it fully covers all the possible criteria and factors, influencing the decision. In this case the list of criteria might be too long due to what inapplicable. According to the second approach, the list of criteria is made as small as possible, what can lead to oversimplification.

The created list of criteria divides criteria to pecuniary and non-pecuniary. The list of non-pecuniary criteria consists of five attributes. In order to check, whether the list covers the majority of possible criteria, which might influence the Entrepreneurial Decision, a qualitative research was conducted.

Choice Criteria represent the reasons of individuals to become entrepreneurs, due to what one of the ways of checking the applicability of the criteria classification is to ask a significant number of real entrepreneurs to name the motivating factors of being entrepreneurs and to check whether the reasons named can be allocated to one of the groups in the classification.

Business News Daily Journal conducted a survey (2016), in which 120 entrepreneurs were asked to name the main reason of being entrepreneur. The survey data was used in order to check the applicability of the created classification. Nearly all reasons, mentioned by interviewees were non-financial. A table with five groups of criteria was created. Each reason, presented in the survey was considered and if it was related to one of the groups, it was allocated to the corresponding column.

The full table of 120 reasons allocated to five groups of criteria is presented in Appendix I. The results of the survey are presented below.

4.4 Survey Results.

116 out of 120 reasons were allocated to one of the groups of criteria, what means that the classification covered 96,6% of all reasons mentioned by the entrepreneurs. That demonstrate that the classification is applicable in an experiment and covers majority of the criteria, which were presented in Business News Daily survey.

The four reasons which were not assigned to any of the groups were:

Reason 86 “You don't have to be a genius. Simply study what other successful people have done, and implement it into your business — and then turn around and mentor others”.

Reason 44: "The best part of being an entrepreneur is that you can get out of it exactly what you put in. The harder you work, the bigger the reward." It can be considered as a pecuniary criterion.

Reason 35 and 114 are related to family issues: “My kids see me fail and then pick up the pieces and try again — all good life lessons that teach perseverance”, “To set the best example for my children possible”. These reasons can’t be related to the belonging to entrepreneurial or business society or group, due to what they can’t be allocated to any of the groups of criteria.

Reason 41 (“Reconnect with and assist people”) can be allocated to Belonging (reconnect with) and Social Preference (assist people) as interviewee names two reasons of being entrepreneur.

Table 3. Survey Results (in % of the Total Number).

	Allocated	Freedom	Esteem	Realisation	Social	Belonging
Number	116	36	4	50	14	12
%	96,6	31	3,4	43,1	12	10,5

Overall 116 answers (96.6% of all reasons named are divided into one of the groups). 36 reasons (31%) of reasons were allocated to the group Freedom, 4 (3.3%) - to Esteem, 50 (43,1%) - to Realisation, 14 (12%) to Social Preference, 12 (10,5%) to Belonging.

A small number of Esteem factors might be due to two reasons: firstly, because individuals were asked to name one main reason for being entrepreneurs, what doesn’t allow them to specify all motivating factors. Another reason is that people might avoid admitting that they are looking for approval, recognition and respect by others (Hansbury, 2009). This might cause

biased results due to the self-reporting procedure.

The group of factors Realisation appears to be very diversified but has the same nature of self-actualisation, achieving goals and realisation of one's potential, "doing what you like and like what you are doing", etc.

The Freedom as a criterion also demonstrates a wide concept. It includes freedom to choose the business sphere, the company's strategy, the market, the people to work with, etc.

Social Preference and Belonging are less often mentioned as the main reasons of being entrepreneur.

Another interesting observation is that five reasons, named by entrepreneurs, can be allocated to a common subgroup, which can be named *Fairness*.

Reason 44: "The best part of being an entrepreneur is that you can get out of it exactly what you put in. The harder you work, the bigger the reward."

Reason 19: "You are not waiting for a boss to notice your well-done work to give you a promotion or a raise. You earn it the moment you earn it; the reward is immediate".

Reason 72: "For me, it really is the idea of being responsible for my own success or failure. I would much rather be at the mercy of the marketplace than any "superior" in the workplace."

Reason 112: "As an entrepreneur, there are no corners to hide in, no fall guys to take the blame and no bigwigs to take credit for your work. Every day that I get up to work, I know that whatever I do is going to make a difference to my company. You can't buy that kind of motivation."

Reason 39: "The greatest reason to be an entrepreneur? The incredible fairness of it — there's no force more fair in the world than the marketplace of ideas. The live-and-die fairness of the market awakens something inside of you — passion, hunger, fear — that makes you feel more alive than you've ever felt before."

As it was mentioned earlier, reason 44 can be considered as a pecuniary criterion. But on the other hand the interviewee speaks about fairness in terms of give and get back. Reason 19 also tells about the reward, which is fairly received by the person who deserves it. Reason 72 mentions responsibility and the fact that the consequences of a mistake are received by the person who made the mistake.

Fairness demonstrate a possible criterion in Entrepreneurial Decision, which could be considered as a motivating factor in Entrepreneurial career choice. Entrepreneurs believe that their reward corresponds to their performance if they work for themselves, what is not the case in a career in a company. On the other hand, the interviewees who mentioned fairness as the main reasons of being entrepreneur also include other motivating factors in their explanation. Reason 44 include the pecuniary motivation: "you get out exactly what you put in". Reasons

19 “the reward is immediate” might assume financial factors or Realisation. Reason 72 “being responsible for your failure or success” also is related to realization. Reason 112 also speaks about Realisation in form of “taking credit of your work” and “motivation”. Reason 39 directly mentions “passion, hunger and fear that makes you feel more alive”.

Other minor criteria were also identified from the interviews, such as *Feeling of Ownership, Feeling of Control (*“love being an entrepreneur because of control”, “I have control over how I want my company to be branded”*) and Security* (“not afraid to by fired”).

As the goal of the Paper is to identify a common list of criteria, which would be applicable in an experimental context, the original classification would be applied. Adding additional minor criteria, which appeared ones or twice in the list of criteria, such as Feeling of Control, Feeling of Ownership and Security would make the criteria list too long what would cause biases in scoring the alternatives (Malczewski & Rinner, 2015). According to the interviewees explanations of reasoning, Fairness as a possible criterion, can be considered as a subgroup of Realisation.

Part III of the Dissertation would apply the created classification in the experiment devoted to analysis of the effect of a non-financial approach to agricultural sphere of entrepreneurship promotion.

5. CONCLUSION.

The Paper "Policy Effect on Entrepreneurial Decision Modeling and Entrepreneurship Criteria Classification" emphasises the importance of diversification of Policy Maker's and Decision Maker's perspective on entrepreneurship in agriculture. The differences in two perspectives limits the impact of entrepreneurship in agriculture promotion methods. The main reasons of the two perspectives difference were identified through application of Behavioral Economics and Decision Theory and include Decision Maker's biased perception of his/her assets and underestimation of external risks and competition (overoptimism and overconfidence) as well as limited information on market opportunities and governmental regulations. The Decision Maker perspective was also divided to Factors and Gains consideration. Factors were classified to internal and external, while Gains were classified to pecuniary and non-pecuniary criteria.

The Model, suggested in the Paper offers several important findings. Firstly, the perceived benefits of agricultural sphere are not equal to the real benefits, secondly the importance of criteria for different groups of entrepreneurs vary, due to what the methods of promotion for different industries should be focused on different factors. In a career choice the wage from a career in a company and expected income from entrepreneurship are not always compared to each other. If the Decision Maker applies satisfying rule, both the expected salary and income are compared to a certain minimum level, what attracts greater attention to non-financial criteria in career choice.

The Entrepreneurial Decision Criteria Classification or the Entrepreneurship Determinants Classification based on Decision Maker's perspective was created on the base of existing literature, Maslow approach and checked through application of the classification to 120 reasons of being entrepreneur, named by real entrepreneurs. The classification consists of pecuniary and non-pecuniary criteria. Non-pecuniary criteria include Realisation, Esteem, Social Preference, Freedom and Belonging.

The next Part of the Dissertation would present an experiment, conducted on the base of the created Policy Effect on Entrepreneurial Decision Model. The experiment would also apply the created classification of entrepreneurial decision criteria.

REFERENCES.

1. Aakvik, A. et al (2005) "Estimating treatment effects for discrete outcomes when responses to treatment vary: an application to Norwegian vocational rehabilitation programs." *Journal of Econometrics 125: 15–51*

2. Bradley, R. (2014) "Decision Theory: A Formal Philosophical Introduction" *London School of Economics and Political Science.*

3. Cooper, A., Woo C., and Dunkelberg W. 1988. "Entrepreneurs Perceived Chances for Success".

4. Dewhurst, M. (2009) "Motivating people: Getting beyond money." *McKinsey&Company.*

5. Edwards, W. (1984) "How to make good decisions." *Acta Psychologica, 56,* 5-27.

6. Entrepreneurship at a Glance, 2015, OECD http://www.keepeek.com/Digital-Asset-Management/oecd/industry-and-services/entrepreneurship-at-a-glance-2015_entrepreneur_aag-2015-en#page15

7. French, K., Fama, E. (1989) "Business conditions and expected returns on stocks and bonds". *Journal of Financial Economics. V. 25, Issue 1, pp. 23-49.*

8. Fursdon, D. 2013. "We need to get young people excited about farming." *The Guardian.*

9. Hobbs, B., Meier, P. (2000) "Energy Decisions and the Environment: A Guide to the Use of Multi-Criteria Methods." *Kluwer's International Series in Operational Research and Management Science, Kluwer Academic Publishers, Boston.*

10. Holland, P. (1986) "Theory and Method Statistics and Causal Inference." *Journal of the American Statistical Association Volume 81, Issue 396.*

11. Hurst, E., Pugsley, B. (2010) "The Non Pecuniary Benefits of Small Business Ownership." *University of Chicago.*

12. Ichino, A. (2007) "The problem of causality in microeconometrics." *University of Bologna.*

13. Jackson, P., Suomi, R. (2002) "eBusiness and Workplace redesign." *Routledge Taylor &Francis Group. London and New York.*

14. Keeney, R. (1982) "Decision Analysis: An Overview". *Operations Research, Vol. 30, No. 5, pp. 803-838.*

15. Keeney, R., Raiffa, H. (1976) Decisions with Multiple Objectives. *Wiley, New York.*

16. Kolok, N. (2014) ”Let Employees Choose When, Where and How to Work”. *Harvard Business Review.*

17. Kotler, N. (1990). “Sharing Innovation. Global Perspective on Food, Agriculture and Rural Development”. *Smithsonian Institutions.*

18. Kremer, W. Hammond, C. (2013) "Abraham Maslow and the pyramid that beguiled business". BBC news magazine.

19. Leavy, J., Hossain, N. (2014) “Who Wants to Farm? Youth Aspirations, Opportunities and Rising Food Prices”. *Institute Of Development Studies. Vol. 2014 No. 439.*

20. Leisinger, K. (2015) “Business needs to embrace sustainability targets.” *Nature, Vol.528(7581), p.165. Nature Publishing Group.*

21. Long, R. Shields, J. (2010) “From pay to praise? Non-cash employee recognition in Canadian and Australian firms”. *The International Journal of Human Resource Management, Vol.21(8), pp.1145-1172.*

22. Malczewski, J., Rinner, C. (2015) “Multicriteria Decision Analysis in Geographic Information Science”. *Springer Science+Business Media New York.*

23. Maslow, A. H. (1943). “A Theory of Human Motivation.” *Psychological Review, 50(4)*, pp. 370-96.

24. Maslow, A. H. (1970). “Motivation and personality”. *New York: Harper & Row.*

25. Montis, A. et al (2005) “Assessing the quality of different MCDA methods.” *Alternatives for Environmental Valuation, pp.99-133.*

26. Morgan, Stephen L. (2001) “Counterfactuals, Causal Effect Heterogeneity, and the Catholic School Effect on Learning.” *Sociology of Education 74:341–74.*

27. Morton, A, Barbara, F. (2011) “Behavioral Decision Theory.” *London School of Economics, Management Department.*

28. Neumann, J. Morgenstern, O. (1953) “Theory of Games and Economic Behavior.” *Princeton, NJ. Princeton University Press.*

29. OECD, 2008, A Framework for Addressing and Measuring Entrepreneurship http://unctad.org/meetings/en/SessionalDocuments/ciid29_en.pdf

30. P. Sullivan (2006) “Estimation of an Occupational Choice Model when Occupations are Misclassified.” *Bureau of Labor Statistics.*

31. Panchal R. and K Dua (2013) “A study on motivational factors for becoming the women entrepreneur in Haryana (India).” *Abhinav. International Monthly Refereed Journal of Research In Management & Technology.*

32. Parker, Simon C. (2009) “The Economics of Entrepreneurship”. *Cambridge University Press.*

33. Pearl, J. *(2000) "Causality: Models, Reasoning, and Inference." Cambridge University Press.*

34. Phillips, L. D. (1984). "A Theory of Requisite Decision Models". *Acta Psychologica. 56 pp. 29-48.*

35. Phillips, L. D. (1989). "Decision analysis in the 1990s." *Birmingham: The Operational Research Society.*

36. Phillips, L.D. (2005). "Decision Analysis in 2005". *London School of Economics & Political Science. Catalyze Limited.*

37. Pitt-Watson, D. (2014) "Entrepreneurship is a Basic Freedom". *Stanford Graduate School of Business.*

38. Raman K. and S. Jayasingam. (2008) "Motivational Factors Affecting Entrepreneurial Decision: A Comparison between Malaysian Women Entrepreneurs and Women Non Entrepreneurs". *International Business Information Management Association. Volume 2.*

39. Ramsey, Frank P. (1931), "Truth and Probability." *Foundation of Mathematics and Other Logical Essays. New York, Harcourt, Brace and Co.*

40. Ranyard, R. (2005) "Decision Making Strategies". *Encyclopedia of Statistics in Behavioral Science.*

41. Schoemaker, P., Russo, E. (1993) "A pyramid of decision approaches". *California Management Review; V. 36, N. 1, p. 9.*

42. Shane, S. (2013) "Why entrepreneurs choose freedom over money". *Entrepreneur*.

43. Shelley, L. (2014) "Why Belonging Is Key in Today's Workplace". *Switch & Shift.*

44. Steffens, N. (2014) "Culture of Belonging Help Boost Productivity". *German Journal of Research in Human Resource Management.*

45. United Nations Conference on Trade and Development, 2015, Trade and Development Board Investment, Enterprise and Development Commission, Seventh session, Geneva http://unctad.org/meetings/en/SessionalDocuments/ciid29_en.pdf

46. United Nations Conference on Trade and Development, 2015, Promoting entrepreneurship for development.
http://unctad.org/meetings/en/SessionalDocuments/ciid29_en.pdf

47. Williams, J., et al. (2012) "Financial and Managerial Accounting". *McGraw-Hill, p. 1117.*

48. Wit, G. de (1993) "Models of self-employment in a competitive in a competitive market". *Journal of Economic Surveys, 7, 367-397.*

APPENDIX I. Entrepreneurship Determinants Classification Check.

(120 Reasons of Being Entrepreneur).

Freedom	Esteem	Realisation	Social	Belonging
1. Able to set my own schedule.	17. Desire to prove yourself right.	2. Take a risk on a passion.	12. Contributing something larger than yourself.	20. Meet with so many great women.
5. You own your destiny.	45. Able to say "my company".	3. Constantly rediscovering myself.	22. Mentor and train new hires and witness their development.	31. Entrepreneurs community has an energy.
7. Get to travel wherever I want.	59. Media coverage… hit of validation.	4. Always something that I can do to improve.	27. Can be a vehicle for social change.	
10. Create my own definition of success.	60. Founder high… customer tells you you created something…	6. Ability to create something from nothing.	47. Give my employees their paycheck.	
11. Respond to opportunities quickly. In corporate life decision could take so long.		8. Motivation to be the hardest working version of myself.	51. Helping shape the future of the world.	41. Reconnect with and assist people.
13. The freedom to live in other countries.		9. Possibilities are endless.	52. Get to decide how I help and who I help.	46. Ability to interact with wide range of individuals
14. Creating a culture that supports my values.		16. It forces me to be a better me.	53. Create sustainable corporate culture.	56. Work with like minded individuals.
15. You can let your freak flag fly.		18. Allowed to create a career that didn't exist.	69. Help train next generation.	62. Fascinating people to work with.
24. Got out of office politics.		19. Reward is immediate (don't wait for boss to notice you)	76. Change people's lives.	65. Make real impact in community.
25. Can decide my own hours.		21. I'm really building something.	97. Make a career possible for other women.	80. Go through this journey hand in hand (two cofounders).
26. Ability to arrange my life around my priorities.		23. A source of energy.	98. My team and I can stay healthy.	81. Choose the people I surround myself with.
		29. It doesn't feel like work.		
28. Freedom to use my ingredients as I wish.		30. Absorbing all the knowledge you can.	111. Bring something new to the world.	96. Allows to have two families, my

			own and my company
32. I'd rather be running for food then sit in 12-by-12 pit.	36. Starting business was empowering and exciting.	119 Help other women.	100. Work side by side with my daughter.
33. Create the future you want.	42. Will always be facing new challenges.	38. Add value to society.	105. Seeing my children design business ideas and watching my entrepreneurial spirit continued through my daughters.
34. Decide what the company perks are.	43. Ability to grow my company.	41. Reconnect with and assist people.	
37. Because of control.			
40. Can tell myself to go to hell .. not afraid to be fired.	49. Never bored.		
48. Control over how my company is branded.	54.Would have never stepped outside my comfort zone.		
50. Freedom to design your menu.	57. Constantly learning.		
55. Flexibility to attend children events.	66. Real world MBA.		
58. Don't deal with any unnecessary rules.	68. It's creating value.		
61. Not trapped…if I decide to do something else.	72. Responsible for my own success or failure.		
63. Freedom to make decisions.	73. Being able to track my success.		
64. Work pajamas.	74. I can conflate to my heart's content doing anything else.		
67. I want it my way.	75. Cannot do anything else.		
70. Best route for women. The independence, confidence, character, financial sustainability, education and, importantly, sense of self.	78. No longer work. A passion.		
71. Enjoy weekend every day.	82. Face my fears.		
77. Dress or not to work.	83. Love the process of change.		
79. Hitting the gym every single day.	85. Bet on yourself.		

84. Wear yoga pants.	
90. Permission to say “yes”.	87. Love what I do.
93. Decorate office how I like.	88. Accumulate as many experiences in life as possible.
101. Push the envelope, as we are not bound by the way it's always been done. We see that as an opportunity to disrupt, redefine and invent.	89. Challenge status quo.
107. Doing whatever I want.	91. Forces to develop personality.
115. Swearing and wearing superhero T-shirts.	92. Different every day.
120. I'm not smarter than my boss.	94. Professionalism-meets-flippantly-fun.
	95. Got an education.
	99. I always win.
	102. Roll with the punches of owning a business. Pitfalls become learning experiences.
	103. Creating from scratch.
	104. I see it as game.
	106. Think outside the box.
	108. Living dangerously aspect of risking your money that is highly satisfying.
	109. Break out of the old molds.
	110. It’s a disease.
	112. No corners to hide in. no fall guys to take the blame and no bigwigs to take credit for your work.
	113. Get to be innovative.
	116. Calm in the chaos. love for what you do.
	117. Can figure anything out.
	118. The hustle.
	39. Passion, hunger, fear – that makes you feel more alive.

Part III. Promotion of Entrepreneurship in Agriculture. Experiment on Non-Pecuniary Method.

1. INTRODUCTION.

"Promotion of Entrepreneurship in Agriculture. Experiment on Non-Pecuniary Method." is Part III of the Thesis "Behavioral Economics and Decision Sciences Application in Agricultural Entrepreneurship Promotion". The key objective of the Thesis is to create a new perspective on entrepreneurship in agriculture promotion methods, through application of Behavioral Economics and Decision Sciences. The main motivation of the research is the limited effect of current approaches of agricultural entrepreneurship promotion, the reasons of this limited effect were identified in Part I and Part II of the Thesis and can be presented as a follows:

1. Policy Maker's perspective on entrepreneurship determinants is different from the Decision Maker's perspective (or potential entrepreneur's perspective) due to limited knowledge of the Decision Maker about current market situation and opportunities, infrastructure, governmental support and other factors and also due to overconfidence and overoptimism of the potential entrepreneur.
2. The majority of methods applied by the Policy Makers are focused on increasing the number of the hereditary entrepreneurs (farmers and those who received farms from their parents), while promotion of non-hereditary entrepreneurship in agriculture doesn't receive the same attention. However, non-hereditary entrepreneurship in agriculture, according to the existing literature, is considered as more effective, bringing new technologies, networks, education and capital to the industry.
3. The effect of the current methods of agricultural entrepreneurship promotion is limited also due to the fact that Policy Makers mostly focus on pecuniary methods of promotion, while the non-financial determinants are also significant for the Decision Makers.

The main goal of the Part III is to test the effect of a non-financial approach to agricultural entrepreneurship promotion. Part III presents the experiment conducted in the University of Barcelona. Eight groups of students, who took part in the experiment, were divided to four Treatment and four Control groups. The Treatment simulated a non-pecuniary approach to

agricultural entrepreneurship promotion: experiment participants were informed about celebrities and famous people, who are involved in the agricultural business. The Treatment is expected to influence the perceived value of the agricultural sphere of entrepreneurship, which includes non-financial benefits of entering the industry, such as esteem, self-realisation, freedom, feeling of belonging and social preference. The Treatment is expected to have a debiasing effect on the existing biased perception of the agricultural sphere as non-fashionable and lacking innovations. The Treatment is assumed to influence the perceived prestige and status of the agricultural sphere and attract additional attention to its opportunities. The Treatment effect was tested through application of Decision Sciences approaches, including Multi-Criteria Decision Analysis (MCDA). The effect was evaluated by assessment of the change in perceived attractiveness of the sphere as well as in change of perceived performance of the agricultural sphere on a number of criteria. The list of criteria, which the experiment participants were asked to assess, was created in the Part II of the Thesis and contains one financial criterion Income and five non-financial criteria, mentioned above. Experiment participants evaluated the value of agricultural sphere of entrepreneurship on all six criteria, comparing the sphere to five other business spheres; they also evaluated the weight or importance of each of the criterion swing (the relative importance of criteria taking into account the alternatives performance).

The results of the experiment were evaluated from several perspectives. The Treatment Effect was calculated, based on three approaches to outcome variable: binary, discrete and continuous. The agricultural sphere perceived benefits (performance of the business sphere on six criteria) and criteria importance in Treatment and Control Groups were compared. The experiment results were also divided into two groups (both in Treatment and Control) based on the score, which experiment participants assigned to the attractiveness of the agricultural sphere. The background data, provided by the experiment participants, was used in experiment results analysis. The regression model was created on the base of the experiment results in order to assess the effectiveness and applicability of the entrepreneurship criteria classification, created in the Part II of the Thesis.

2. APPLICATION AND EXTERNAL, INTERNAL VALIDITY.

A number of academic papers (Phelan & Sharpley, 2011) demonstrate that the level of entrepreneurial competence in agricultural sphere is lower than in other sector, what proves importance of entrepreneurship promotion. According to the Part I results, non-hereditary entrepreneurship promotion is crucial for the agricultural sphere development as it brings innovations, new technologies, capital, knowledge, education and business networks to the sphere. Non-hereditary entrepreneurs (in contrast to hereditary, who receive land and business from their parents) often don't have previous experience in agro-sphere. As a result, the knowledge about the industry and industry opportunities might be limited. Part I and II of the Thesis clearly demonstrated that the lack of knowledge about industry opportunities, market perspectives, opportunities of business diversification and governmental support limits the number of entrepreneurs in the sphere and decreases the effectiveness of the agricultural entrepreneurship promotion. Another factor, which limits the number of new entrants in the agricultural sector, is the low *Attractiveness* of this business sphere.

"It (agricultural sphere) isn´t viewed as an attractive alternative to other work sectors such as manufacturing, private, and public sector employment" (Sulaiman, 2013).

The concept of Attractiveness assumes not only financial characteristics of the sector perspectives but also non-financial benefits. A number of articles and reports emphasize the importance of such characteristics of the industry as prestige and image.

"Agriculture has never been considered to be a prestigious occupation…." (Kotler, 1990).

"Farming and farm support programmes… should improve the image of the sector" (Leavy, 2014)

"It also changed the social image of the sector. Many started to look upon rural areas as uninteresting wildernesses and became ignorant of agricultural processes" (Peters, 2012).

"We need to get young people excited about farming" (Fursdon, 2013)

The emotional perception, the image, status, prestige of the Industry can be influenced by different approaches and policies. One of the approaches, which is used in business in improving the products and companies' image, is the so-called *Celebrity Branding.* Advertisers expect that the positive image of celebrity would pass to the product's or brand's or company's image (Lee, 2008).

The Experiment Treatment applies an approach, which is similar to Celebrity Branding. The goal of the treatment is to inform the experiment participants about the famous people, involved in the agricultural business. The approach assumes involvement of celebrities in advertisement of agro-sphere, however, in contrast to a standard advertisement, the celebrities, participating in promotion, should be involved in agricultural sphere themselves.

The treatment is expected to influence the perceived non-financial benefits of the agricultural entrepreneurship through the increase in prestige, improvement of the image of the agricultural sphere. The purpose of the treatment is to simulate an approach, which can be applied in agricultural entrepreneurship promotion.

This suggested instrument of the agricultural entrepreneurship promotion is based on the results and conclusions of the Part I of the Thesis, which proved that non-pecuniary instruments in agricultural entrepreneurship promotion are underused and underestimated and can play a significant positive role in agro-sphere promotion. A classification of non-pecuniary attributes in entrepreneurial decision making process was developed in Part II and includes Esteem, Self-Realisation, Freedom, feeling of Belonging to the corresponding society (entrepreneurial, business society, etc) and Social Preference (opportunity to help others). The Treatment is expected to influence the perception of the non-financial benefits of the agricultural sphere, the methods of the Treatment effect assessment will be explained further.

The advertisement of the agricultural sphere with celebrities through social media, for example, seems applicable and appears to be a possible way of the agricultural sphere promotion. In other words, Treatment models an instrument, which potentially can be applied.

Another important aspect of the experiment is its external validity. The sample, used in Treatment and Control Groups, should be representative, in other words it should represent the population, in which the Policy Makers are interested. The concept of external validity is related to generalization and assumes that the results of the experiment, conducted on a sample of a population can be used to make predictions about the population.

The experiment results have high external validity as the sample represents a group of population, in which the Policy Makers are interested as in potential future entrepreneurs in Agriculture.

As it was previously mentioned in Part I of the Thesis, the research is focused on promotion of entrepreneurship in the sphere of agriculture for the non-hereditary entrepreneurs. Students of business schools and students in universities, receiving business education, can be considered

as one of the groups of population, which might be potential non-hereditary entrepreneurs in agro sphere due to several reasons. There is significant prove that knowledge and experience in the sphere of entrepreneurship increases the probability of becoming entrepreneur (Parker, 2009). As business students receive the necessary knowledge and train skills, the probability of becoming entrepreneurs is significantly high. Existing literature also proves the importance of business education in different industries development. Articles confirm correlation between business education and entrepreneurship development (Kurek, 2009) and show the significant role of business education in economic development (Doherty, 2006). Also, the literature provides significant evidence that business education increases the probability of entrepreneurial success (Becker, 1964).

According to the existing research, entrepreneurship in agriculture needs more young people.

"The younger lot want to innovate while the older lot don't" (Bathurst, 2014).

"The Agricultural sphere lack young people": according to the European Council of Young Farmers (Conseil Européen des Jeunes Agriculteurs – CEJA) the total number of farmers in 15 EU member states decreased by 9% between 2000 and 2007, while the decrease in the number of young farmers was 42% (Peters, 2012)

The lack of young people in the sphere and negative consequences of this trend is discussed in a number of articles (Curry, 2003).

As a result, young people with business education, represent a group of population with high probabilities of becoming innovative entrepreneurs, they receive necessary knowledge and education in the spheres of economics and finance and can also bring business networks to the rural areas.

The experiment was conducted in the University of Barcelona (UB), Faculty of Economics, with business students of the 2nd and 3rd year. The University of Barcelona was chosen due to several reasons. Firstly, the University has Department of Behavioral and Experimental Economics, which provided useful advises on experiment conduction. Secondly, Spain is an EU country with strong agricultural sector. The Cataluña's agri-food industry is the first seller at national level. This sector currently provides 3.4% of the employment of the Cataluña's industry (European Commission Press Release Database, 2007). According to the Rural Development Program for Cataluña, the RDP budget of the region for the 7 years period is €810.8 million (€348.6 million from the EU budget, and € 462.2 million of national co-funding).

The experiment also has high internal validity, which is related to the causal effect of the experiment, and which assumes randomised allocation of participants into the Treatment and Control Groups. The UB students of the 2nd and 3rd years of education on each program were randomly divided by the University administration into two groups. All students of each program had the same courses and lectures, but were divided into group one and group two in order to allow optimal number of students in the class. The Treatment was conducted in one group of each program, while the Control Groups were presented by the other group of each program.

3. METHODOLOGY.

3.1 Experiment Design.

The experiment should be designed in such a way that the answers of the experiment participants would make it possible to measure the change in perception of the agricultural sphere of entrepreneurship after the Treatment. The Treatment informs the experiment participants about the celebrities and famous people, involved in the agricultural business, what should improve the image of the industry, increase its prestige and rise the attractiveness of the sphere.

One of the Part II of the Thesis conclusions was that the best evaluation framework for the potential entrepreneur's decision is the Multicriteria Additive Value Model, due to what the experiment design was based on the Multi-Criteria Decision Analysis application. The Multicriteria Additive Value Model assumes that the Decision Maker has several alternatives and several criteria, on the base of which he should make a decision. Each alternative can be given a score on each of the criteria, each of the criteria also have different importance for the Decision Maker. The decision is made based on the scores given to the alternatives and the importance of the criteria. The MCDA approach helps the Decision Maker in alternatives evaluation, the software, which is used in MCDA application evaluates the value of an alternative as a cumulative value, or the attractiveness, calculated as a sum of scores on each criterion multiplied by the importance of criteria.

One of the aspects of the experiment design is the additional question, which asks the experiment participant to evaluate the attractiveness of each of the alternatives. In other words,

the experiment design assumes that the participant should evaluate the perceived attractiveness of the agricultural sphere of entrepreneurship and to evaluate the sphere on all criteria, which are expected to determine its attractiveness.

The term "Attractiveness" is a wide concept, it can be considered as a quality that causes an interest or desire in something (Ortony, 1990). From the Decision Modeling perspective Attractiveness can be interpreted as a cumulative value of the evaluated alternative. The declared Attractiveness should correspond to the results of the other questions, answered by the experiment participants, which are the scoring of each Alternative on each of the criteria presented and evaluation of the importance of criteria.

This paragraph explains in more detail the Multicriteria Additive Value Model, applied in the experiment, the criteria used in the questionnaires and the alternatives suggested in the experiment.

3.1.1 Multicriteria Additive Value Model.

Multi-criteria utility & value calculus for modelling multiple objectives & trade-offs evolved from the Decision Theory with Ramsey (1931) and von Neumann & Morgenstern (1947) as some of the main contributors. Multi-Criteria Decision Theory was created by Keeney & Raiffa (1976) and can be characterised by the formula:

$$V_i = \sum_{j \epsilon J} w_j \, v_{i,j,}$$

Where the value V of an alternative i is calculated as a sum of the alternative scores on each criterion v_j multiplied by w which is a scaling constant that equates units of value, in other words w is the relative criterion importance. *J* is an index set of criteria.

The main idea of the MCDA approach is that the Decision Maker has several alternatives and several competing criteria, due to what competing goals appear. The decision is made based on the performance of each alternative on each of the criteria taking into account the importance of each of these criteria.

In MCDA the "w" or the importance of a criterion is calculated according to the "swing weighting" procedure. The differences in values between the levels of a most and least preferred options on two given criteria ('swings') are considered and interviewees are asked to evaluate

the relative value of the swings. In other words, the interviewee assesses not the importance of a criterion as it is but the greatest difference between the alternatives performance.

The evaluation framework can be characterised by the following formula.

$$V(a) = \sum_{j=1}^{n} w_j v_j(a) \qquad \text{Where: } \begin{cases} v_j(best_j) = 100, \forall j \\ v_j(worst_j) = 0, \forall j \end{cases}$$

Where V(a) is the value (Attractiveness) of the agricultural sphere,

$v_j(a)$ is a partial score of agricultural sphere in terms of criterion j,

w_j is the relative weight of criterion j,

$w_j =$ importance of the swing from $v_j(best_j)$ *to* $v_j(worst_j)$,

$\sum_{j=1}^{n} w_j = 1$ and $w_j > 0$ $(j = 1, \dots n)$.

In order to apply MCDA methodology in agricultural sphere attractiveness evaluation, agriculture should be compared to other spheres of entrepreneurship activities as the Decision Maker, according to the model, should compare several alternatives.

3.1.2 Decision Alternatives.

Decision Alternatives should cover the majority of business opportunities, which the Decision Maker might be considering in his/her career decision. In order to achieve this goal, the list of these business spheres was created with the application of one of the most commonly used industries classification, The Industry Classification Benchmark (ICB) which is the industry classification taxonomy launched by Dow Jones and FTSE. According to the classification, the Industries are divided to: Oil and Gas, Basic Materials, Industrials, Consumer Goods, Health Care, Consumer Services, Telecommunications, Utilities, Financials, Technology.

The total number of industries according to the ICB classification is ten. However, the greater is the number of alternatives the higher is the probability of a bias appearance as the interviewee evaluates his subjective attitude to the swings importance. “Number of criteria should be minimum. Decision Makers cannot handle large number of criteria.” (Keeney and Raiffa, 1976). Also the agricultural sphere, according to the ICB classification, is a part of the

Consumer Goods industry. The final list of alternatives, used in the experiment was shortened to six spheres: Constructions and Industrial Goods, Consumer Goods, Consumer Services and Health, Agribusiness, Finance and Technology. The list represents six spheres, which, on the one hand is easier to evaluate for the experiment participants due to a smaller number of industries and on the other hand covers nearly all the industries of economy.

3.1.3 Choice Criteria.

The Multi-Criteria Decision Analysis assumes that the Decision Maker creates his own list of criteria, on the base of which he/she expects to make a decision. However, if the experiment participants would be asked to create their own lists of criteria, the data received would be suitable only for the qualitative analysis. As the goal of the experiment is to measure the effect of the Treatment, the common list of criteria was used in the experiment questionnaire.

The list of criteria, which can be used by the potential entrepreneur was developed in Part II of the Thesis and represent six attributes: Level of Income that each of the sphere can provide, Level of Freedom (freedom in work schedule, in choosing the direction of business development, in choosing the market niche, the product positioning strategy, etc.), Level of Esteem (respect and recognition from other people), Self-realisation, Social Preference (opportunity to help people, society and environment) and Belonging (feeling of belonging to a certain society or social group such as entrepreneurial or business society, etc).

The list of criteria consists of pecuniary factor – Income and other five non-pecuniary factors. The criteria, or the goals of the Decision Maker can be competing. For example, the financial sphere might be considered by the Decision Maker as the most profitable, but not as attractive in terms of Self-realisation and Social Preference as agricultural sphere, which at the same time is considered as less profitable.

3.2 Experiment Procedure.

The experiments were conducted in September and October 2015 in the University of Barcelona, Faculty of Economics**.** The experiments were organised in eight groups of 2nd and 3rd year business students.

Originally, two possible ways of samples creation were considered:

1. To invite students to participate in an experiment through experiment advertisement on the University's website and printed ads, distributed in the Faculty.
2. To conduct an experiment in classrooms during the last 20 minutes of the class.

In both cases, a money compensation is provided to students in a form of a money lottery. Each student receives a questionnaire with a number, at the end of the experiment a random number is generated through a random number-generating computer program. The winner receives 10 euros. The number of the money prizes was calculated according to the number of participants (one prize per 10 participants), so the probability of winning the 10 euro money price was p=0,1.

The Second option (to conduct an experiment in classrooms 20 minutes before the end of the class) was chosen due to several reasons. Firstly, expected number of people who would participate in the experiment in case of the first approach application would be limited, the University administration estimated the number of show-ups as very low. The second and more important reason was the problem of self-selection, which would be unavoidable in case of the first approach application.

As a result, the second option was chosen for the experiment conduction.

20 minutes before the end of the class, the students were invited to participate in a non-compulsory experiment, at the end of which a 10 euro per 10 people lottery would be made. As a result, only in one group four people decided not to participate and left the class, all the other students took part in the experiment. The experiments were conducted in eight groups of students.

At the beginning of the experiment, interviewees were asked to imagine that they are planning to become entrepreneurs and are evaluating the Attractiveness of different business spheres. In the first question interviewees are asked to evaluate six spheres (Constructions and Industrial Goods, Consumer Goods, Consumer Services and Health, Agribusiness, Finance and Technology), giving 100 points to the most attractive one and all the other spheres from 0 to

100 according to the level of attractiveness. In the first question, interviewees are evaluating their subjective perception of the industries. The term "Attractiveness" is commonly used in MCDA interviews (Morton, 2008).

Then interviewees were asked to evaluate all the six spheres by six criteria (attributes): Level of Income that each of the sphere can provide, Level of Freedom, Level of Esteem, Self-realisation, Social Preference and Belonging. Attribute in MCDA is a quantitative measure of performance of alternative associated with a particular criterion (Morton, 2010).

Each interviewee was asked to give 100 points to the sphere which provides the highest attribute score (for example, which sphere can provide the highest Income, from the student's point of view), to give 0 point to the sphere which provides the lowest level of attribute (the lowest Income), and to give scores from 0 to 100 to all other business spheres. The text of the questionnaire, which explains the task, is presented in Appendix I. As a result, each business sphere received scores from 0 to 100 on all six criteria presented to the experiment participants. Each experiment participant evaluated how much Freedom, Esteem, Self-realisation, Social preference, Belonging and Income each of the suggested business spheres can provide.

In this survey interviewees are providing their subjective perception of alternatives performance which doesn't necessary correspond to the real performance, however in decision making process individual makes his decision according to his subjective assumptions, due to what the results of the experiment correspond to the goals of the research. The Table 1 represents the list of attributes and business spheres, which interviewees were assessing.

Table 1. List of Attributes and Alternatives.

Construct	Goods	Services	Agro	Finance	Technology
Income					
Realisation					
Esteem					
Freedom					
Social					
Belonging					

The last question of the questionnaire asks the interviewees to evaluate the swings importance. Students are asked to evaluate the importance of each criterion swing, meaning the

importance of a change from 100 points to 0. The meaning of the "swing" can be explained by a following example: the experiment participant gives the sphere of Finance 100 points on criterion Income and 0 points to the Agriculture sphere on the same criterion, than he gives the Technology sphere the highest score on criterion Self-realization, while the sphere of Construction receives the lowest score on criterion Self-realisation. In this case, the interviewee compares these two swings (on criteria Income and Self-realisation) from 0 to 100 and evaluates which swing is more important for him. He might say that the difference between the highest and lowest Income is the most important factor for him, then the Income swing received 100 points. If the Income swing is twice more important than the Realisation swing, then Realisation receives 50 points.

The experiment participants were explained the swing weighting procedure in detail, were provided with an example and were suggested to ask questions if something was unclear.

The questionnaire also contained 13 questions concerning the interviewees' background. The background information was used in order to check for the possible unobservables, and in order to check the influence of other factors on interviewees' choice.

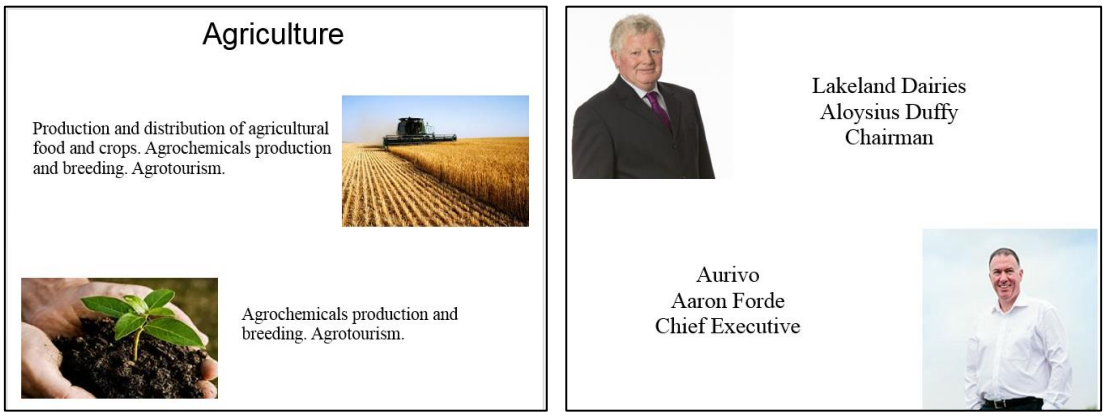
The 13 background questions included the gender, age, city of birth, parents education, entrepreneurs in the family (parents or grandparents), the business sphere, if anyone of the family members is entrepreneur, family income, whether the interviewee considers entrepreneurship as his/her future career and the sector in which he/she expects to work and in which he/she wants to work, the last question was asking the interviewee whether he/she consumes organic products.

In order to achieve the highest level of understandability of the tasks and questions in the questionnaire the students were told to ask questions if something was not clear or some part of the questions were not understandable. In the first two groups (22 interviewees in Control and 26 interviewees in the Treatment Group) the experiment was done in English, as these groups were taking the majority of classes in English. In the rest six groups of students, the experiment was made in Spanish (the mother tongue of the class majority). Both the presentation and the questionnaires were presented in the native language of the experiment participants what should have decreased the probability of biases due to limited knowledge of the foreign language of the students.

3.3 Treatment.

Both the Treatment and Control groups were given the same questionnaires (APPENDIX I). Before the survey, participants were shown a short presentation, which contained the overview of the industries (APPENDIX II). The presentation gave a brief explanation of each of the business sphere and several examples of the sphere's representatives with their photos. The representatives were the Directors, CEOs or CFOs of one of the 100 biggest companies in a particular industry, ranked by turnover in 2014 (on Forbes, Construction Index and other websites). The companies, shown in the presentation, were taken from the end of the list (from 90 to 100 place) in order to present the companies that are not known to the students. The pictures in the presentation which represented the industries were neutral and boring as well as the photos of the industries representatives. The only difference was in the presentation of the Agricultural sphere. In the Control Group the Agricultural sphere presentation was neutral, while in the Treatment Group students were shown famous representatives of this business sphere.

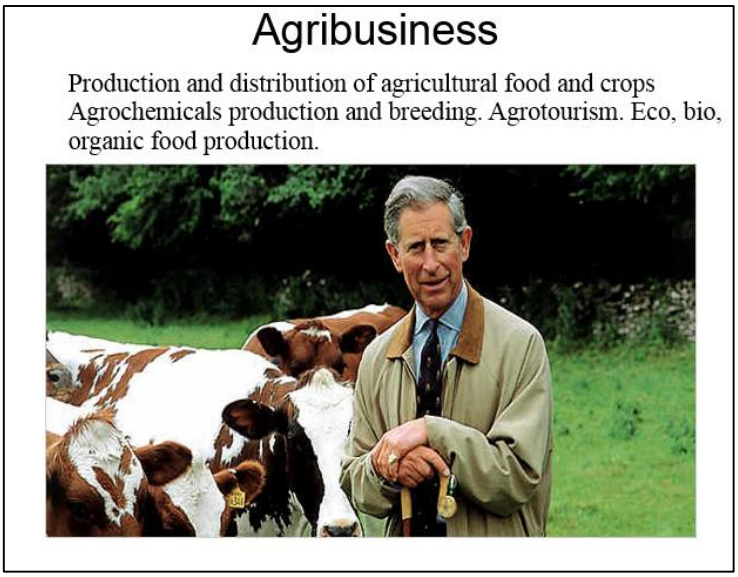
Picture 1. Agricultural Sphere Presentation in Control Group.



Picture 2. Agricultural Sphere Presentation in Treatment Group.

The slides were demonstrating celebrities, who are involved in production of agricultural products. The list of celebrities included the world famous people (Charles, Prince of Wales, who has his agricultural products company Duchy Originals, also singer Sting, Elizabeth Hurley and Oprah Winfrey) and Spanish and catalan celebrities: José Antonio Iniesta (famous football player and wine producer), Antonio Banderas (wine and olive oil producer), football players and Casalobos wine producers Emilio Butragueño, Joan Llobet, José Miguel González, Miguel Bosé.

Picture 3. Agricultural Sphere Presentation in Treatment Group.



The aim of the treatment was to increase the attractiveness of the agricultural sphere of entrepreneurship through the advertisement of the sphere.

3.3.1 Treatment Effect Assumptions.

As it was shown in the Part I and Part II of the project, the choice of the industry for entrepreneurship might depend not only on the financial factors but also on non-pecuniary factors, such as Self-realisation, Esteem, Freedom, Social Preference and Belonging. The non-financial factors depend on the individual's interest in the industry (which can be characterized as Realization), the status and prestige of the industry (which can be characterized as Esteem), the opportunity to belong to a certain society of people (Belonging). The non-pecuniary factors provide opportunities for utilization of new instruments in Agricultural sphere promotion. In

this research, we assume that one of such approaches to promotion might be advertisement of the industry through informing the interviewees about famous and well-known celebrities who are involved in agricultural products production.

A great number of articles were written on the influence of celebrities on people's lives, point of view and perception. "Ethics of Celebrities and Their Increasing Influence in 21st Century Society" (Choi, 2010), "Did our brains evolve to foolishly follow celebrities?"(Tehrani, 2013), etc.

The use of famous people in products and services advertisement is not a new idea, however in case of a standard marketing instrument we are talking about a different type of promotion. When celebrities are promoting certain products, most often, they do not use them themselves. The consumer knows it but still can be influenced by the advertisement. In this Experiment, the idea of celebrities involvement is different. Famous people, shown in the presentation to the Treatment group, are all involved in the production of agricultural products. Celebrities, shown in the presentation, represent members of the agricultural entrepreneurial society. Involvement of celebrities in the industry increases the prestige and status of the sphere and might influence students' emotions.

I assume that the Treatment will have several effects. The Treatment will influence the perceived prestige of the industry, causing such emotions as Pride. Pride is evoked by appraisals of the self's accomplishments and rising social status (Tracy & Robins, 2004). This rise of the social status of Agricultural entrepreneurship activity will be the effect of the Treatment. The Treatment might also widen the perceived opportunities of the industry, possibilities of growth and brand building. I base this effect on an assumption that the sphere of Agriculture is often underestimated by potential entrepreneurs (Gurrieri, 2014). As it was mentioned in previous Parts of the Research, the sphere of Agriculture suffers from biased perception of its opportunities and development directions.

I expect that the Treatment will improve the perceived Attractiveness of the Agricultural sphere of entrepreneurship. In other words, the Treatment should increase the average score, assigned to the Agricultural sphere Attractiveness. I also expect that the score assigned to the Agricultural sphere on criterion "Esteem" would be higher in the Treatment Group. Esteem, as it was mentioned in the Part II of the Paper, assumes respect by other people. The book "Modern Human Relations at Work" (Hegar, 2012), proves that "prestige carries with it respect and status and influences the way people talk and act around individual". The Treatment should also influence the criterion "Belonging", as the criterion assumes belonging to a certain society,

business group or environment, which is connected to this particular sphere of business. The fact that celebrities belong to the Agricultural business society should increase the average performance of the Agricultural sphere by this criterion. The Treatment might also influence other criteria and might cause the change in average importance of the criteria.

From the assumptions, described above several predictions on the experiment results can be made.

The *First Prediction*, that will be tested, is that the difference between attractiveness of the sphere of Agriculture in Control and Treatment Groups will be statistically significant.

According to the *Second Prediction*, the Agricultural sphere performance in Treatment Group would be significantly higher on several criteria.

According to the *Third Prediction*, there would be a correlation between the Attractiveness of Agriculture and the importance of the criterion "Income". According to the literature review in Part I and Part II of the Thesis, the Income importance for entrepreneurs in the sphere of agriculture is often higher than the Income importance of the entrepreneurs in urban areas. I assume that this conclusion is based on the performance of only hereditary entrepreneurs, while non-hereditary entrepreneurs might have an opposite perspective on the Income importance.

3.3.2 Experiment Limitations and Consistency Check.

The experiment design includes the Multiattribute Value Model, based on the MCDA approach, however a number of differences with this Decision Sciences approach exist, what might add complications to the experiment results analysis.

Firstly, the Multi-Criteria Decision Analysis methodology assumes that the Decision Maker creates his own list of criteria. This approach, however, would not allow quantitative data analysis, due to what a common list of criteria was used in the experiment. Interviewees don't make the list of attributes themselves, but are presented with the list of criteria groups. As a result, interviewees might face difficulties in evaluating the importance of criteria as criteria explanation and time allocated for the questionnaires is limited.

The second main difference with the MCDA approach is that interviewees are not presented with the feedback information. Each individual is not shown the results of the swing-weighting procedure, interviewee is not shown the cumulative weight of different groups of factors and is not presented with the Hiview software results, which show how the alternative's score changes

with the change of the swing importance. The feedback information is an important instrument in decision facilitation. As it was mentioned in the Part I of the Thesis, the cognitive abilities of the Decision Maker are limited, and decision process is often biased. The MCDA feedback procedure helps in identifying biases in criteria importance evaluation. As the Part III experiment procedure doesn't assume any feedback, the results of the experiment might be biased.

The last difference of the experiment procedure with the MCDA approach is that interviewees are not personally interested in the results of the experiment (MCDA application assumes that interviewees receive assistance in alternatives evaluation through MCDA methodology and software application).

The experiment participants should answer all the questions, needed for the calculation of the total value of the alternative, which is often calculated applying software Hiview and which shows the cumulative value of an option, taking into account all the scores, assigned to the alternative on all criteria and multiplied by the criteria weights. The experiment procedure doesn't include the feedback, which assumes the presentation of the total value of alternatives, due to what another way of the interviewees consistency check should be applied. The approach, used in the experiment, represented additional question, which was asked in the beginning of the interview, which is the Attractiveness of each of the alternative presented, evaluated on a 100 points scale. In terms of the Multicriteria Additive Value Model (as it was stated in Part II the *i* which stands for alternative was substituted by *a*) $V_a = \sum_{j\epsilon J} w_j \, v_{a,j,}$ the experiment participants provide the values for all the elements of the model: he/she evaluates the $v_{i,j,}$ which is the scores assigned to each of the alternative on each of the criterion, w_j which is the weight of each of the criterion, and the experiment participant also evaluates the V_i which is the total level of Attractiveness of the cumulative value of an alternative.

The assessed level of Attractiveness of the sphere should correlate with the results of the alternative assessment on the six criteria, taking into account the criteria weight. In other words the value assigned by the experiment participant to V_a should correspond to the $\sum_{j\epsilon J} w_j \, v_{a,j,}$. The "Attractiveness" score would help in checking the consistency of the students' preferences. It would show whether the used list of criteria is applicable in determining the Agricultural sphere Attractiveness. The comparison of the Control and Treatment Groups would show whether the effect of the Treatment is consistent. In other words, if the interconnection between the Attractiveness score and the other scores would be higher in the Control Group that can be interpreted as a sign that the Treatment Effect is inconsistent. On the other hand, if the

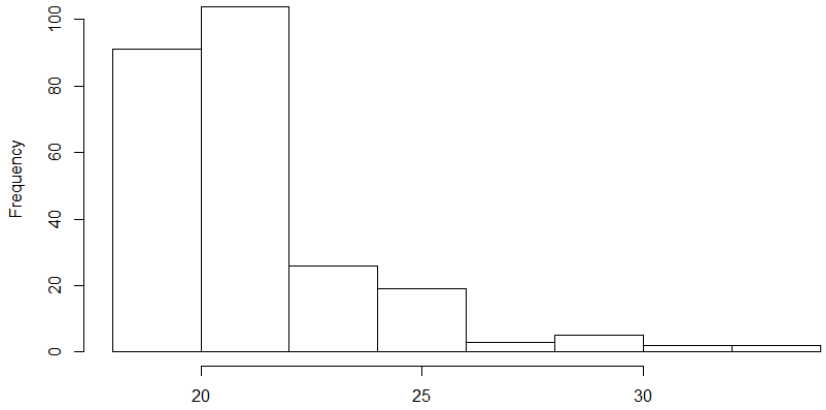
interconnection between the results would be higher in the Treatment Group, that might be a sign that the Treatment has a debiasing effect on the perception of the Agricultural sphere.

4. RESULTS.

4.1 Sample.

The total number of experiment participants was 253 (120 in Treatment Group and 133 in Control Group). The average age 21 (age of participants ranged from 19 to 34 years).

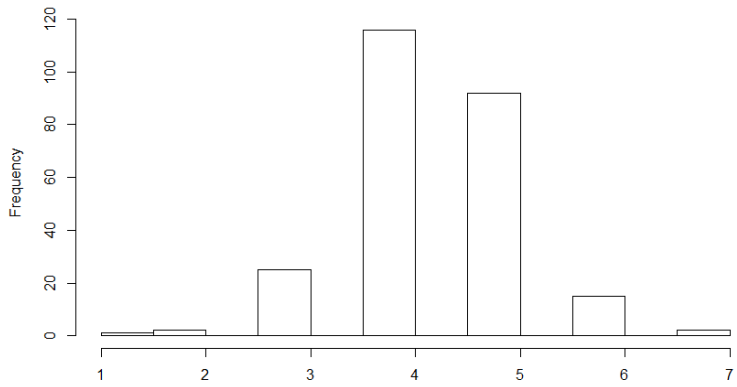
Graph 1. Age Histogram.



As we can see from the Graph 1 the majority of experiment participants are between 19 and 22. 117 out of 253 participants (46,3%) have at least one parent with high education. 130 (51%) participants have entrepreneurial parents or grandparents. 214 out of 253 (85%, vast majority) are considering entrepreneurial career in future. 140 participants (55%) are from Barcelona, 77 (30%) are from small cities in Spain and 36 (15%) interviewees are from other countries. 106 (41,9%) are female and 147 (58,1%) are male.

The interviewees were also asked to evaluate the level of the family's income from 1 (very poor) to 7 (very rich), the majority of interviewees declared average income.

Graph 2. Histogram of the Interviewees' Families' Income.



From the sample overview, several assumptions can be made. Firstly, there might be a correlation between the presence of entrepreneurial parents and choice of education. As we can see from the experiment results 51% of business class students have entrepreneurial parents. Also the fact that 85% of interviewees are considering entrepreneurial career is an important result. This result corresponds to the existing literature, according to which there is significant prove that knowledge and experience in the sphere of entrepreneurship increases the probability of becoming entrepreneur (Parker, 2009).

Taking into account large percentage of entrepreneurial parents, another assumption, which can be made, is that there would be a strong correlation between the entrepreneurial parents' sphere of activity and industry choice of the interviewees.

4.2 Treatment Effect.

According to the First Prediction, the difference between the Attractiveness of the sphere of Agriculture in Control and Treatment Groups will be statistically significant. The experiment was conducted in classical experimental design what assured random assignment of interviewees to the Treatment and Control Groups.

The Part II of the Thesis identified two perspectives on ATE assessment, which differ in terms of the outcome variable y_i.

The Average Treatment Effect is evaluated as a difference in mean values of the outcome variable y_i:

$$ATE = \frac{1}{N_1}\sum_{i=1}^{N_1} y_{1,i} - \frac{1}{N_0}\sum_{i=1}^{N_0} y_{0,i}$$

N_1 is the number of experiment participants in Treatment Group, N_0 is the number of experiment participants in the Control Group. $y_{1,i}$ and $y_{0,i}$ are the outcome variables in the Treatment and Control Groups respectively.

The Decision Maker assesses the Attractiveness of six spheres of entrepreneurship, giving the alternatives scores from 0 to 100, the most attractive alternative receives 100. The goal of the research is to evaluate the change in Attractiveness of the Agricultural sphere, due to what the outcome variable y_i can be presented either as a continuous variable or as a discrete variable. Discrete outcome variable demonstrate the business sphere, to which the experiment participant assigned the highest score of Attractiveness, 100 points. The discrete outcome variable might have a value q, from 1 to 6 (the numbers from 1 to 6 denote one of the six business spheres number), which would mean the business sphere which received the highest score of Attractiveness. The Decision Maker would choose the option q if the value of this option would be the highest: $y_i = q\ if\ \ V_{qi}^* = \max\{V_{1i}^*, V_{2i}^*, V_{3i}^* \dots, V_{Qi}^*\}$.

The discrete outcome variable can be transformed into a binary, so that y_i would be equal to 1 if the Agricultural sphere is given 100 points, and equal to 0 othervise. In other words, this approach compares the number of experiment participants in Treatment and Control Groups who gave 100 points of Attractiveness to the Agricultural sphere.

The second approach evaluates the outcome variable y_i as a continuous variable, which represent the Attractiveness score, which experiment participants give to the Agricultural sphere.

$$\frac{1}{N_1}\sum_{i=1}^{N_1} y_{1,i} - \frac{1}{N_0}\sum_{i=1}^{N_0} y_{0,i}$$

$y_i = 0, \dots 100, \qquad y_i - attractiveness\ score\ of\ the\ alternative\ Agriculture.$

The ATE results in case of the binary outcome variable can be presented in the following table.

Table 2. Agricultural Sphere as the Most Attractive Alternative.

	Treatment	Control	Difference
Number of 100 points to Agriculture	15	1	14
Number of 100 points (in %)	12,5	0,75	11,75
Number of participants	120	133	13

The ATE = $\frac{1}{N_1}\sum_{i=1}^{N_1} y_{1,i} - \frac{1}{N_0}\sum_{i=1}^{N_0} y_{0,i} = \frac{1}{120}\,15 - \frac{1}{133}1$ = 0,125 – 0,0075 = 0,1175.

In other words, in the Treatment Group with 120 interviewees the number of students who gave Agricultural sphere the highest score is 15 times more than in the Control Group with 133 participants. The Average Treatment Effect is the difference in percentage of the interviewees who evaluated the Agricultural sphere as the most attractive sphere of entrepreneurship. In Treatment Group the percentage of such interviewees was 12,5%, while in the Control Group it's 0,75%. The difference (11,75%) proves the effect of the Treatment.

If y_i is evaluated as a continuous variable, then ATE can be calculated as:

$$\frac{1}{N_1}\sum_{i=1}^{N_1} y_{1,q,i} - \frac{1}{N_0}\sum_{i=1}^{N_0} y_{0,q,i}$$

$y_q = 0, \ldots 100$. N_1 is the number of units in Treatment Group, N_0 is the number of units in Control Group, $y_{1,q,i}$ is the evaluated Attractiveness of the sphere of agriculture (q) by individual i in the Treatment Group and $y_{0,q,i}$ is the evaluated Attractiveness of the sphere of Agriculture (q) by individual i in the Control Group.

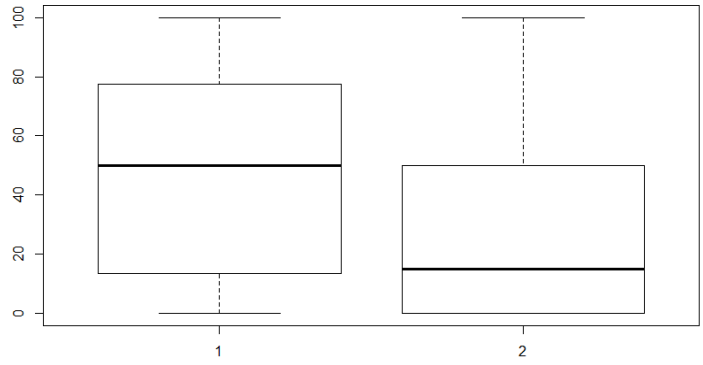
The ATE = $\frac{1}{N_1}\sum_{i=1}^{N_1} y_{1,q,i} - \frac{1}{N_0}\sum_{i=1}^{N_0} y_{0,q,i}$ = 44,93 – 23,8 = 21,13. As the level of Attractiveness was evaluated on 0 to 100 scale, the increase in the level of Attractiveness of the Agricultural sphere in Treatment Group is 21,13%. In order to check the statistical significance of the difference in average attractiveness score the t-test was applied. Welch's Two Sample T-test results prove that the difference in the average Attractiveness score (44.93 average score for the Treatment and 23.8 Control Groups) is statistically significant (p-value = 2.197e-07 with 95 percent confidence interval 13.34019 - 28.91746).

Table 3. Agricultural Sphere Mean Score in Treatment and Control.

	Treatment	Control	Difference
Mean	44,93	23,8	21,13
t-test			5.3455
(p-value)			(2.197e-07)

In order to visualize the difference in mean Attractiveness score of the Agricultural sphere, the boxplots were used.

Picture 1. Agriculture Attractiveness in Treatment (1) and Control (2).



The Treatment and Control Group data visualisation also clearly demonstrates the difference in perceived level of Attractiveness of the Agricultural sphere.

Both approaches show that the Treatment increases the Attractiveness of the Agro-sphere and increases the number of experiment participants who evaluate Agriculture as a business sphere with the highest value among all the presented alternatives.

However, the Effect of the Treatment, evaluated applying binary model, doesn't necessary mean that the students, which gave the Agricultural sphere 100 points, would choose entrepreneurial career in Agriculture in future. Also the increase in the average Attractiveness score of the Agriculture doesn't show the change in probability that the individual i would choose option q (the Agricultural sphere of entrepreneurship): $\Delta^{ATE} = \Pr(Y_i^t = 1) - \Pr(Y_i^c = 1)$.

The Attractiveness score, transformed into a binary outcome variable, demonstrates the percentage of people in different groups who consider the Agricultural sphere as the most attractive sphere. In order to further analyse the career plans of the experiment participants additional open questions were added to the questionnaire which include career plans of the students.

The Treatment Effect, which is based on a continuous outcome variable and which shows the change in the mean score of the Agricultural sphere Attractiveness, shows the effect of the Treatment in a form of a change in perception of the Agricultural sphere. The existing literature, mentioned in the Introduction, emphasises the importance of the perception of the Agricultural sphere and a need of approaches, which would be directed to improvement of the sphere perception and Attractiveness: "It (agricultural sphere) isn´t viewed as an attractive alternative to other work sectors" "We need to get young people excited about farming" (Fursdon, 2013), etc.

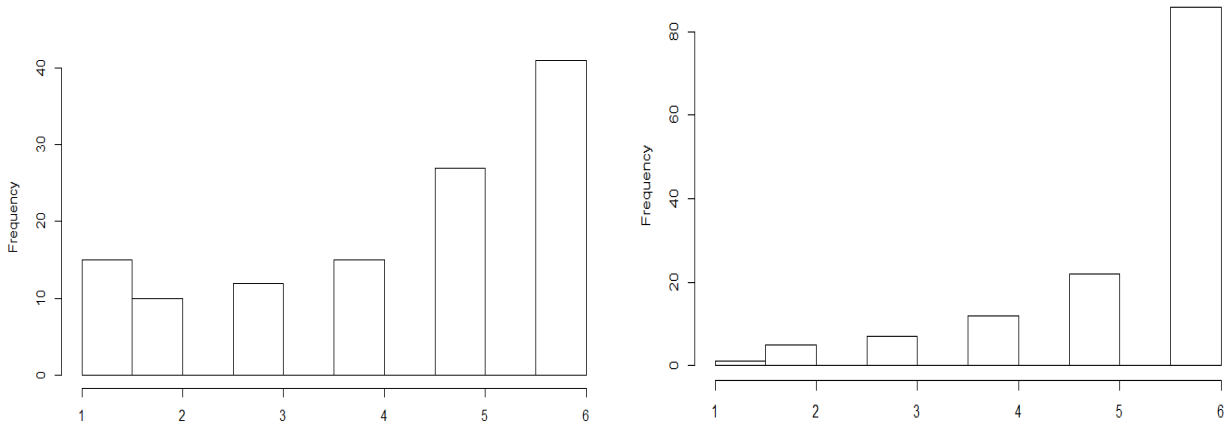
So, the change in the average Attractiveness score of the Agricultural sphere is a considerable indicator of the usefulness and applicability of the modeled instrument of Agro-sphere entrepreneurship promotion.

Another possible way of Treatment Effect evaluation is the ranking of the Agricultural sphere among other spheres of entrepreneurship. The scores, given to the industries can be transformed into the industries ranking. The ranking was assigned to Agricultural sphere on the base of the comparison of the scores assigned to other alternatives. The Agricultural sphere Attractiveness was compared with each of the other spheres one-by-one, and was given 1 point if the level of Attractiveness was higher than the second sphere and 0 if not. As a result, the sum of all points was calculated for each interviewee and the score of Agricultural sphere ranked from 0 to 5, where 0 meant that the sphere had the lowest level of attractiveness and 5 meant that it had the highest level of attractiveness. Score 4, for example, meant that the Agricultural sphere was the 2nd most preferred option out of 6 possible spheres.

The two histograms present the results of the Agricultural sphere ranking in case of Treatment and Control groups.

Graph 3. Agricultural Sphere Ranking.

Treatment Group. *Control Group.*



The histograms show the difference in ranking in the Treatment and Control Groups. The percentage of 1st, 2nd and 3rd places is much greater in the Treatment than in the Control Group, what increases the chances of Agricultural sphere to be considered in future.

The Average Treatment Effect and t-test demonstrate the effect of the Treatment and the influence of the non-financial method of agricultural entrepreneurship promotion. However, the future effect of a Policy based on the experiment would be difficult to accurately predict. The correlation between the evaluated Attractiveness of the sphere and future career of the students is not known. Another complication is that the effect of non-financial factor might have a lag in time. In other words, the measurement of the effect of promotion of the Agricultural sphere, applying non-financial instruments, might be more complicated than the financial instruments effect.

However, the significant increase in the Attractiveness of the Agricultural sphere after the Treatment shows that the perception of the industry, its opportunities and prestige can be influenced.

The research results open a new direction of experiments: comparison of the influencing effect of different celebrities on Decision Makers. The comparison of different advertisement effects might be useful in choosing the proper promotional strategy. As it was earlier mentioned, 3 types of celebrities were shown in the Treatment Group presentation: world famous (not Spanish or Spanish speaking, such as HRH Charles the Prince of Wales, Sting, Elizabeth Hurley and Oprah Winfrey), Spanish speaking (Antonio Banderas, Emilio Butragueño, Joan Llobet, José Miguel González, Miguel Bosé) and local for the Barcelona students catalan celebrity Antonio Iniesta. The influence of locally born celebrities might be different from the influence

of the world famous celebrities born abroad. This observation opens new perspectives for further experiments.

4.3 Criteria Importance and Alternative Perceived Performance in Treatment and Control Groups.

The Treatment and Control Groups demonstrate different results of the mean level of Attractiveness of the Agricultural sphere as well as the Agricultural sphere performance on the number of criteria. Also the importance of the criteria swing change depending on whether the Group received the Treatment or not.

The Table 4 presents three groups of results for the Treatment and Control Group. The table presents the Attractiveness score, which the experiment participants assigned to the Agricultural business sphere when they were asked to directly evaluate the level of Attractiveness of all the six business spheres presented. Secondly, the table presents the perceived average performance of the Agricultural sphere on six criteria. In other words, the experiment participants were asked to evaluate how much Income, how much Freedom, Realisation, etc. each of the business sphere can provide him/her if he/she would become an entrepreneur in one of the spheres. The scores, assigned to the Agricultural sphere are presented in the table. The third part of the results represent the perceived weights of the criteria, which were identified applying the swing weighting procedure, described previously.

Table 4. Agriculture Attractiveness, Scores and Criteria Weights.

	Treatment		Control		Difference
	Mean	**Std. Dev**	**Mean**	**Std. Dev.**	**Mean**
Attractiveness	44,93	34,6	23,8	27,4	21,13
		Performance			
Income	23,3	28,55	16,99	26,4	6,31
Freedom	57,08	37,75	44,05	39,6	13
Esteem	41,49	39,32	23,16	33	18,3
Realisation	56,73	40,36	36,83	36,4	20
Social	70,72	33,8	54,06	39	16,7
Belonging	39,33	36,21	34,56	36,5	4,8
		Importance			
Income	79,55	20,96	84,6	18,6	-5,05
Freedom	68,56	26	68,15	26	0,41
Esteem	62,67	26,55	70,18	25,9	-7,51
Realisation	83,53	22,29	86,4	20,4	-2,87
Social	50,69	33,95	47,2	30,9	3,5
Belonging	35,05	33,73	28,51	33,9	6,54

As we can see from the table, Treatment influenced Agricultural sphere performance in case of every criterion, what shows a balanced effect of the Treatment and a stable change in perception of the Agricultural sphere.

The Treatment demonstrated that celebrities and royal family members are involved in the Agricultural sphere. It increases the prestige of the sphere, as it was mentioned previously. The prestige was expected to influence the Belonging criterion as it can make people feel themselves a part of a high-level society. However, criterion Belonging shows the lowest increase from the Control to the Treatment Group, what might be a sign that students don't expect to have a strong feeling of belonging even to the regional agricultural producers (the Treatment presented the locally born celebrity Jose Iniesta). However, the influence of the Treatment on performance of the Agricultural sphere on criterion Belonging might be different depending on the country. The experiment was conducted in the University of Barcelona in Catalunia, Spain. An

assumption, which can be made based on the existing activities of celebrities and royal family members in Agro-sphere in different countries is that in the UK the same Treatment might have a greater effect on criterion Belonging due to high involvement of the royal family in local agricultural communities support. The Prince of Wales, for example, is Patron of a number of organisations which are focused on preserving rural communities such as Aberdeen Angus Cattle Society, Dry Stone Walling Association, Lleyn Sheep Society, National Hedgelaying Society, Poultry Club of Great Britain, Rare Breeds Survival Trust, Royal Agricultural Society of England and the Welsh Black Cattle Society (The Prince of Wales and the Duchess of Cornwall official website). This assumption opens a new direction of research based on the difference in perceived belonging to a certain community or society among agricultural entrepreneurs.

Another reason of a limited effect of the Treatment might be connected with the way celebrities were presented to the students. In the Treatment Group, the students were simply shown the famous people involved in Agricultural sphere. An interview with a locally known celebrity, who would address young students directly (in a short video presentation, for example), might have a greater influence on the perceived performance of the Agricultural sphere on criterion Belonging.

The second smallest change in perceived performance of the Agricultural sphere is on criterion Income. The perceived mean performance increased only by 6,31 points. The Treatment was expected to influence the perception of non-hereditary benefits of the sphere so this result was expected. Though the strong effect of the Treatment on other criteria allows an assumption that the perceived low income performance of the Agricultural sphere is connected with the lack of information about the Agricultural sphere opportunities. The average Income score of the Agriculture is 16,99. However, there is a great probability that the experiment participants are not aware of a great number of opportunities, offered by the Agricultural sphere. Most of the respondents would not think about organic food production, additional businesses, which can be based on the Agricultural production, such as agrotourism, the experiment participants also won't think about highly profitable spheres of agriculture such as flowers and dried flowers production, snail farming, mushroom farming and other spheres which might be in great demand. For example, the snails market is booming in the UK and the snails producers can't cope with the high demand (Milmo, 2014). The Agricultural score of 16,99 is unreasonably low if compared to the scores of other industries:

Table 5. Performance of Different Alternatives on Criterion Income.

Construct	Goods	Services	Agro	Finance	Technology
55,06	56,62	53,75	16,99	84,23	87,53

The Agricultural sphere is definitely underestimated on criterion Income.

The Agricultural sphere performance improves significantly on criteria Esteem and Realisation (by 18,3 points and 20 points respectively). The strong increase on Esteem in Treatment Group can be explained directly by the influence of celebrities. If famous and reach people are involved in the industry then this industry can't be evaluated as a "non-prestige" or "non-fashionable" or "non-significant". The Treatment also makes people consider the industry more carefully and decreases the probability of a biased perception due to prejudice. The Treatment also influenced the Agricultural sphere performance on criterion Realisation: participants realise that agricultural sphere can provide more opportunities, greater diversity, more customized products and brand building.

Another conclusion, which can be made, is that the Treatment has a stable effect: the mean increase in the evaluated Attractiveness of the industry can be explained by the mean increases in the industry performance on criteria.

From the results, we can assume that the perception of the Agricultural industry in the Control Group is biased. The main goal of the Treatment was to inform the experiment participants about successful agro-sphere activities, performed by famous people. A significant improvement of the Agricultural sphere performance on criteria Realisation and Freedom in the Treatment Group is another sign of experiment participants' limited knowledge about the industry opportunities and perspectives. The increase in the average perception of the Social Preference performance is another interesting effect of the Treatment. Social Preference means altruism, helping others, contributing to the society and protecting the environment, doing good to people and to the nature. The reason of a better performance of the Agricultural sphere on criterion Social Preference might be different. We can assume that some of the celebrities and famous people, shown in the presentation to the Treatment Group, are associated with altruistic activities. Or the attention of wealthy people to the industry of Agriculture is considered as altruistic sign. Additional research is needed in order to identify the reasons of this change in perception of the industry performance.

The mean importance of criteria (evaluated as swings) in Treatment and Control Groups should also be considered.

Applying the MCDA approach, the "Importance" of a criterion is the importance of a swing from the lowest to the highest performance on this criterion. In other words, if, for example, a student evaluated criterion Realisation and gave Construction industry 0 and industry of Technologies – 100, then the evaluated importance of criterion Realisation will present the relative importance of the swing from 0 to 100.

As the Decision Makers are evaluating not the absolute importance of criteria, the change in the mean criteria weights can't be considered as a change in the importance of the factors. The Treatment, as it was shown in the previous paragraph, improved the performance of the Agricultural sphere, what could cause a decrease in the swing between the worst and the best performance.

The importance of the "swing" consists of two factors: the absolute importance of the criterion and the difference between the worst and the best performance of alternatives. However, it is difficult to separate one factor from another. We can assume that the Treatment, applied in experiment, might change the perceived performance and Attractiveness of the Agricultural sphere, but should not significantly affect the perceived absolute importance of criteria. On the other hand, the Treatment might attract greater attention to such factors as prestige and status, due to what criteria Realisation, Esteem and Belonging might be perceived differently. One can expect that the Treatment might increase the importance of these three criteria.

As it can be seen from the Table 4, the importance of Belonging is significantly higher in the Treatment Group. That might be due to the Treatment, which was strongly related to the perception of Belonging to a certain social group. Also due to the treatment, the Belonging as a criterion might have become clearer for the experiment participants (as in the control groups several participants asked to explain the meaning of the criterion Belonging in more detail).

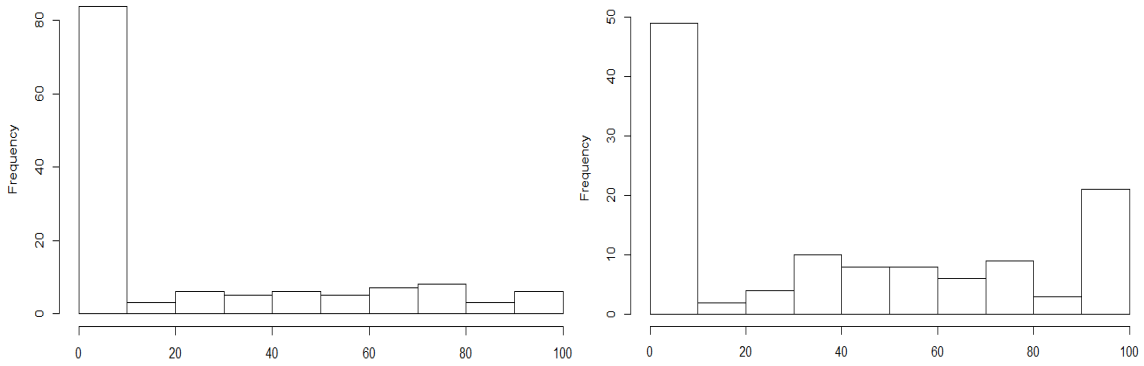
Despite the assumptions made on criteria importance, the importance of the criterion Esteem significantly decreased in the Treatment Group. The difference in importance of criterion Esteem might be due to reduced difference between the industry, which demonstrated the best performance, and the industry, which demonstrated the worst performance on this criterion. This assumption appears from the literature analysis in Parts I and II, according to which the industry of Agriculture is often perceived as not prestigious sphere. The Treatment might have changed the perception of the industry, what could decrease the perceived difference between the industry which interviewee sees as the best on Esteem criterion and the Agricultural industry, which the interviewee might see as the sphere with the lowest performance on Esteem

criterion. If we create a histogram of Agricultural sphere performance on criterion Esteem in Control Group, we'll see that the majority of interviewees gave the Agricultural sphere score "0" (78 out of 133, which is 58% of all interviewees in Control Group), so the importance of the swing in the majority of cases in Control Group meant comparison of the performance of Agricultural sphere as a sphere with the worst performance with another sphere with the highest performance on criterion Esteem.

The histogram, showing the performance of the Agricultural sphere on criterion Esteem in Control and Treatment Group can be presented as follows:

Graph 4. Agricultural Sphere Esteem Score.

Treatment Group. *Control Groups.*



As we can see from the graphs, much less interviewees in the Treatment Group gave "0" to the Agricultural sphere. However, even if the interviewee in the Treatment Group gave the lowest performance score to the Agricultural industry, this "0" score might be perceived not as low as in the Control Group due to the Treatment effect and change in the perceived performance of the Agricultural Industry. From this, we can conclude that there is a high probability that the average importance of the Esteem criterion is lower in Treatment Group due to the decrease in the difference between the industry which has the lowest performance and the industry with the highest performance.

Another way of looking at the Esteem criterion is to consider the mean performance of each industry in Treatment and Control Groups.

Table 5. Mean Performance of Every Industry (Criterion: Esteem).

	Construct	Goods	Services	Agro	Finance	Technology
All	49,6	50,83	61,84	31,85	72,49	82
Control	48,6	52,14	65,1	23,16	76,84	83,2
Treatment	50,7	49,39	58,23	41,49	67,68	80,68

The two industries which show the highest performance are the Financial sphere (76,84 in Control and 67,68 in Treatment Group) and the sphere of Technology (83,2 in Control and 80,68 in Treatment Group). The change of the average performance of the Agricultural sphere in case of Treatment and Control Groups is significantly high (from 23,16 points in Control Group to 41,49 in Treatment Group). In Control Group the mean difference between Technology and Agriculture is 60,04 points while in the Treatment group the difference is 39,19. This mean difference again might be the reason of the change in the mean importance of the swing of the Esteem criterion.

The importance of the Income swing shows similar effect in the Treatment Group and the explanation is probably the same as for the Esteem criterion. Agricultural sphere is often perceived as a sphere with low profitability. The Treatment, however, could change this perception, showing reach and famous people, involved in the agricultural products business and production.

From the Treatment and Control Groups results comparison we can conclude that the Treatment influences more the perceived non-hereditary benefits of the Agricultural sphere: Income performance of the Agro-sphere improved by 6,3 points, while its performance on criteria Freedom, Realisation and Esteem improved by 13 points, 20 points and 18,3 points respectively.

As the mean Attractiveness of the Agricultural sphere increased by 21 points we can conclude that non-hereditary criteria play a significant role in potential entrepreneur's decision making process and might be used in Policy devoted to Agricultural entrepreneurship promotion.

The Treatment result is also a perfect illustration of one of the Entrepreneurial Decision Model conditions presented in the Part II of the Thesis, which is $v_{a,j} \neq v^*_{a,j}$, where $v^*_{a,j}$ is the real performance of alternative a on criterion j and $v_{a,j}$ is the performance of the alternative perceived by the Decision Maker. This condition models the biased perceptions of alternatives

performance. The Treatment provides additional information about the business sphere what improves the perceived performance of the alternative, so that the $v_{a,j,1} \geq v_{a,j,0}$, where $v_{i,j,1}$ stands for the perceived performance of the Agricultural sphere on criterion j in case of Treatment and $v_{i,j,0}$ stands for the performance of the Agricultural sphere on criterion j in case of no Treatment.

4.4 Criteria Importance and Alternative Perceived Performance Depending on the Agro-sphere Attractiveness.

The Part II of the Thesis presented a Model of potential entrepreneur's decision process. One of the model conditions was: $w_{e,j} \neq w_{f,j} \quad \forall e \neq f$, according to which the importance of criteria is different for different groups of population. Applying this result to the experiment, we can conclude that the potential entrepreneurs, interested in Agricultural sphere might have different preferences if compared to potential entrepreneurs who are more attracted to other business spheres. Knowledge about the preferences of the group of population who are attracted to Agriculture might provide useful information for the Policy Maker.

In order to further discover the issue, I've divided the data in Treatment and Control Groups into two sub-groups, according to the alternative preferences: group which would be called MF (more than 50 points group) gave the Agro sphere 50 points of Attractiveness or more, group LF (less than 50 group) gave Agro sphere less than 50 points. I used a threshold of 50 points, applying the results of the Paper: "BRAT and MCDA Approaches in Decision Making in the Sphere of Pharmacology." (Dobryagina, 2010), in which it was proven that the 50 points threshold in Multi-Criteria Decision Analysis experiments plays a significant role in the Decision Maker's alternatives assessment.

The results for the four subgroups are presented in the following table.

Table 6. Attractiveness Based Industry Performance and Criteria Weights.

	Treatment			**Control**		
	MF	**LF**	**Difference**	**MF**	**LF**	**Difference**
Performance						
Income	26,94	19,41	7,52	23,97	14,6	9,38
Freedom	59,35	54,64	4,72	51,91	41,35	10,56
Esteem	55,32	26,71	28,62	33,97	19,44	14,53
Realisation	75,16	37,03	38,13	56,29	30,15	26,14
Social	74,84	66,31	8,53	64,56	50,45	14,1
Belonging	44,27	34,03	10,24	38,38	33,25	5,13
Importance						
Income	73,47	86,05	-12,58	75,41	87,76	-12,35
Freedom	68,71	68,4	0,31	73,68	66,25	7,42
Esteem	61,05	64,4	-3,35	66,18	71,56	-5,38
Realisation	84,02	83	1,02	90,15	85,11	5,06
Social	54,68	46,43	8,25	48,68	46,69	2
Belonging	40,65	29,07	11,58	16,47	32,65	-16,18
Total number, %	**62** **51,7%**	**58** **48,3%**		**34** **25,6%**	**99** **74,4%**	

4.4.1 Agricultural Sphere Performance.

The performance of the Agro-sphere in Treatment Group is higher than in the Control Group in case of all subgroups. In other words, the majority of experiment participants, regardless of the final score given to the Agro-sphere, were influenced by the Treatment to a certain extend.

The greatest difference between MF and LF groups in both Treatment and Control is the difference in performance of Esteem and Realisation. In other words, students, who evaluated Agricultural sphere as more attractive assumed that Agro-sphere can provide significantly high level of Realisation and Esteem, what provides additional confirmation that non-financial

criteria might play greater role in potential non-hereditary agricultural entrepreneur's decision making process.

The differences between MF and LF subgroups in Control and Treatment Groups are different. In Control Group the smallest change in performance is on criterion Belonging (5,13 points average change). That might be connected with the fact that meaning of criterion Belonging was not absolutely clear for all the experiment participants, as in several Control Groups students asked to explain the meaning of criterion Belonging in greater details.

Criterion Esteem demonstrates the second lowest average performance in LF subgroup of both Control and Treatment Groups, which means that for a number of experiment participants the Agricultural sphere is persistently perceived as a non-prestigious business sphere. The difference between the MF subgroups in Treatment and Control Groups is 21,35 while the same difference for the LF subgroups is 7,27, what might mean that individuals who are more attracted by the Agricultural sphere are also more influenced by the Treatment.

Also in the Control Group, the MF subgroup demonstrates that Agriculture received the highest score on criterion Social Preference (64,56) compared to the other average scores, which the sphere received (23,97 on Income, 51,91 on Freedom, 33,97 on Esteem, 56,29 on Realisation, 38,38 on Belonging). That might be a sign that in the Control Group the students who evaluate the Agricultural Sphere as more attractive, highly value it for opportunity to contribute to the society and the environment.

The greatest difference among MF and LF subgroups in the Control Group is on criterion Realisation (26,14 points difference). That can be explained by the fact that experiment participants, interested in the Agricultural sphere are attracted to it mostly by the opportunity of Self-realisation and by other non-financial benefits, which the sphere might offer.

The Treatment Group demonstrate the greatest difference between MF and LF subgroups for criteria Esteem and Realisation, what again points attention to the importance of these two criteria in decision making process of potential entrepreneurs in the sphere of Agriculture.

The table with MF and LF subgroups main goal is to find out why individuals might be attracted to the Agricultural sphere. One of the main observations is the fact that non-pecuniary factors might play more significant role than the financial benefits. In the MF subgroup of the Treatment Group we can see that the Agricultural sphere received the highest mean scores on criteria Realisation (75,16) and Social Preference (74,84), while on criterion Income the average score was 26,94 points. Similar situation is observed in the MF subgroup of the Control

Group: Social Preference and Realisation received the highest average scores (64,56 and 56,29 respectively), while on criterion Income the average score is equal to 23,97. Taking into account that in the MF subgroups the Attractiveness score of the Agricultural sphere was 50 points or higher, we can conclude that the expected Income doesn't explain the level of Attractiveness of the sphere in case of Agro business.

Another important source of information is the weight of the criteria, evaluated by the students, which is the important of the swing of each attribute, presented to the experiment participants.

4.4.2 Criteria Importance.

As it was mentioned in the beginning of the Chapter, the importance of criteria for different groups of population might be different. As the data in both Treatment and Control Groups was divided to MF and LF subgroups, according to the level of Attractiveness assigned to the Agricultural sphere by the experiment participants, we can easily track that the importance of the criteria in the subgroups is significantly different, what can me modeled as $w_{m,j} \neq w_{l,j}$ for criterion j, where $w_{m,j}$ is the mean importance of the criterion j for the group MF and $w_{l,j}$ is the mean importance of the criterion j for the LF group. The greatest difference can be observed in case of criterion Income: both in the Treatment and Control Groups individuals who gave Agricultural sphere higher score of Attractiveness at the same time gave lower score of importance to the criterion Income (the difference between two subgroups in both Treatment and Control group is around 12 points: in Control Group the MF and LF mean scores are 75,41 and 87,76 respectively and in the Treatment Group 73,47 and 86,05). Also the average importance of Income for the LF and MF subgroups in Treatment and Control Groups is similar: 73,47 in MF subgroup of the Treatment Group is very close to 75,41 points in MF subgroup of the Control Group and in case of LF subgroups the situation is the same (86,05 in Treatment and 87,76 points in Control). One of the assumptions which can be made is that the difference in importance of Income in MF and LF subgroups might be partly explained by the difference in perceived performance of the Agricultural sphere on criterion Income. However, the important observation is that the increase in Agricultural sphere performance on criterion Income is less in magnitude (7,52 and 9,38 in Treatment and Control) than the change of its importance as a criterion. Also a negative correlation between the Income importance and Agricultural sphere Attractiveness (what would be discussed in the next paragraph) prove that

the difference in Income importance in MF and LF subgroups is explained by the level of Attractiveness of the Agricultural sphere.

This fact proves that for the potential non-hereditary entrepreneurs in the sphere of Agriculture Income has less significant role than for the potential entrepreneurs who are more attracted by other business spheres.

This experiment result emphasizes the importance of non-hereditary approaches to Agricultural sphere promotion as the group of population which represent the group of potential entrepreneurs with high probabilities of business success (as it was previously mentioned in literature review) shows a different view on the importance of Income criterion then the hereditary entrepreneurs (as it was demonstrated in Part II of the Thesis).

The other differences in MF and LF subgroups vary in Treatment and Control Groups. In Control Group Freedom is 7,42 more important on average in MF Group, while in the Treatment Group the difference is only 0,31. Similar situation can be seen in case of criterion Realisation: 5,06 points is the difference in Control group and 1,02 is the difference in Treatment Group.

An assumption which could be made before the experiment is that students who are more willing to enter the sphere of Agriculture might value more the Social Preference, in other words they might be more focused on the environmental issues, for example. However, the experiment shows significantly higher weight of the criterion Social Preference (8,25 points increase) only in the Treatment Group, what might indicate that Treatment influenced the perceived importance of the criterion Social Preference.

A different situation can be seen in case of the criterion Belonging. In Treatment Group the average score of Belonging is 11,58 points higher in MF subgroup, while in Control Group it's 16,18 points lower. This contradictory result might have different reasons. The criterion could be not clear for the experiment participants as in several groups students asked to explain the criterion. Another reason is the fact that Agricultural sphere is not associated with an innovative and creative society of business people and students who were more interested in Agricultural sphere in Control Group focused more on such non-financial benefits of the Agro sphere as Freedom and Realisation.

In the Treatment Group, students were demonstrated famous people involved in the production of agricultural products. The need for Belonging as emotional need of feeling a part of a certain community, society or group is an important need and the Treatment could attract

attention to this need as a criterion in potential entrepreneur's decision making process. The average importance of criterion Belonging increased only by 6,54 points in the Treatment Group compared to the Control and received a mean score of 35,05 in Treatment Group. However, in the same Treatment Group the average importance of Belonging in the MF subgroup is 11,58 points higher than in LF group. More than that, if we take an average score of Belonging importance for a subgroup which gave Agriculture 70 or more points of Attractiveness, we'll receive an average importance score of 47,3 for the criterion Belonging. In this case, the Treatment group demonstrates that the criterion Belonging is significantly more important for the students who gave Agriculture higher score of Attractiveness. The Belonging criterion weight was influenced only by the change in the absolute importance of the criterion, as in the MF subgroup the performance of the Agricultural sphere on this criterion is higher than in the LF subgroup.

From this result, we can make an assumption, that the Treatment influences more the students who are more interested in Agricultural sphere (the MF groups). Treatment also adds additional value to the non-hereditary benefits of the evaluated alternatives.

The last figures, which attract attention in the Table 6, are the number of people in MF and LF subgroups. As we can see, the percentage of people in the MF subgroup in the Treatment Group is much higher than the percentage of people in the MF subgroup in the Control Group (51,7% and 25,6% respectively). This observation is another prove of the Treatment Effect on the Agricultural sphere Attractiveness.

4.4.3 Criterion Income: Importance and Alternative Performance.

One of the crucial questions of the research is the importance of the criterion Income. The mean performance of the Agricultural sphere on criterion Income is the lowest among all the criteria considered (Table 4).

The consistently lower importance of the Income criterion among students who prefer Agricultural sphere is one of the proves that potential entrepreneurs interested in Agricultural sphere give lower importance to the financial factors than the students who perceive Agricultural sphere as not attractive.

Also in both Control and Treatment Groups students, who gave Agriculture higher scores of Attractiveness, evaluated the Agricultural sphere much higher on criteria Realisation and Esteem, while the Agricultural sphere score on criterion Income didn't change significantly.

That adds additional prove of the lower importance of Income for students, who are more interested in Agriculture.

The correlation between the industries attractiveness and the importance of Income might provide additional information on this issue.

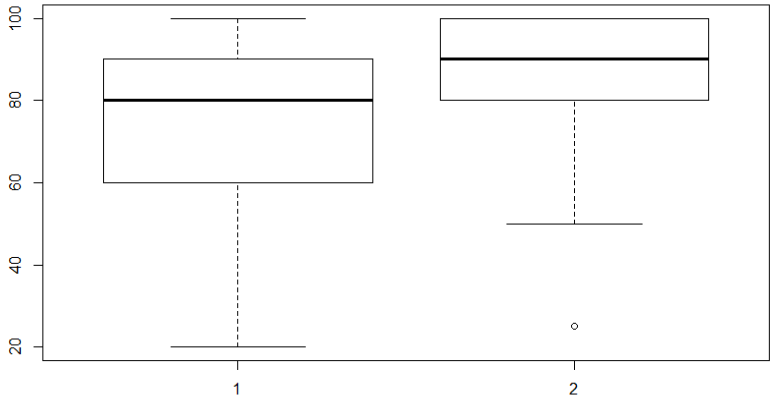
Table 7. Correlation Between Industry Attractiveness and Importance of Criterion Income.

	Construction	Goods	Services	Agro	Finance	Technology
Treatment	0,076	0,16	0,06	-0,34	0,18	0,1
Control	0,08	0,1	-0,17	-0,31	0,19	-0,04
All	0,07	0,14	- 0,04	-0,34	0,17	0,05

The correlation coefficient is a measure of linear association between two variables. We can see a weak negative correlation between the Attractiveness of the Agro sphere and Income importance both in Treatment and Control Groups (-0,34 and -0,3 respectively). The weak negative correlation might be another indicator of the fact that the individuals who are more interested in Agro-sphere give less importance to the Income as a determining criterion or it might be an indicator that for business students, who give less importance to the pecuniary criterion, the Agro-sphere demonstrate more attractive field than for the students who consider the financial criterion first.

In the Picture 2 we can see two boxplots, which show the importance of income for MF subgroup (those who evaluated the attractiveness of Agricultural sphere as 50 or more) and LF subgroup (those who evaluated the attractiveness of Agricultural sphere as less than 50) in Control Group.

Picture 2. Importance of Income for MF (1) and LF (2).



As we can see from the boxplot the mean values of Income attractiveness look significantly lower for the MF Group which evaluated the attractiveness of Agri-sphere higher than the LF Group.

The Two Sample t-test provides the following results: (t = 4.9054, p-value = 2.54e-06) The mean value of the importance of Income in MF (75,4 points) and LF (87,7 points) groups is statistically significant.

As it was mentioned in the Part I of the Thesis, hereditary entrepreneurs in the sphere of Agriculture are more focused on financial benefits in contrast to urban entrepreneurs. But in this experiment we can see a different situation in case of potential non-hereditary entrepreneurs. This result gives additional reasons to consider non-pecuniary motivating instruments for Agricultural entrepreneurship promotion.

4.5 Background data and additional questions.

As it was mentioned earlier, the questionnaires also included questions related to the interviewees' background and additional questions concerning career plans of experiment participants.

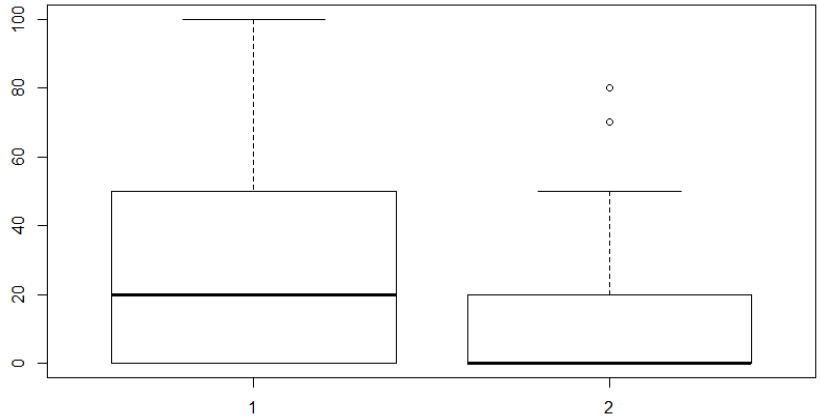
One of the questions was "Do you consume organic products", there were three options: no, sometimes and mostly. I assume that the knowledge about organic products might influence the perceived Attractiveness of the Agricultural sphere of entrepreneurship. In other words, interviewees, who consume organic products are more aware about organic and bio food and might value it more than normal food products. Organic food is associated with higher quality

and better food standards (Carrington, Arnett, 2014) as well as with higher profits (Reganold, 2016). Due to this, I assume that interviewees, who answered “sometimes” or “mostly” would evaluate the attractiveness of the Agricultural sphere higher than those who chose “never”. In order to check this assumption, I used only the Control group data (in order to avoid the effect of the Treatment) and divided the data into two groups: those who answered “sometimes” or “mostly” (group 1, which consisted of 87 people) and those who answered “never” (group 2, which consisted of 46 people).

The t-test proves that the difference in mean values (28.56 in group 1 and 14.8 in group 2) is statistically significant (t = 3.1342, p-value = 0.002166).

The data visualization also shows the significant difference in two groups:

Picture 3. Agriculture Attractiveness for Organic (1) Consumers and Non-organic (2).



It’s also logical to assume that students who consume organic food sometimes or mostly would also rank the performance of the Agricultural sphere higher on criterion Income. That means that those who are aware of organic food would see the Agricultural sphere more profitable than those who are not aware of organic products, however the experiment result shows the opposite results for the Control Group. The same situation can be seen in Treatment Group. Organic consumers evaluated the Attractiveness of the Agricultural sphere much higher than the non-consumers of organic products, however the difference in the expected level of Income between these subgroups is insignificant.

Table 8. Attractiveness of Agriculture and Expected Level of Income.

	Control			**Treatment**		
	Organic	*Non-organic*	*Diff*	*Organic*	*Non-organic*	*Diff*
Attractiveness	28,56	14,8	13,76	50,62	31,67	18,95
Income	15,86	19,13	-3,27	23,94	21,8	2,14
Total Number	87	46	41	84	36	48

Another cluster of additional questions, which provide useful information contains three questions:

"In which sector you expect to work in future", "In which sector would you like to work in future", "If the answers to the previous two questions are different – explain why". The fact that some of the potential entrepreneurs prefer one industry, however, due to certain reasons, expect to work in another, might be useful for the Policy Makers.

Five interviewees out of 253 (nearly 2% of interviewees) declared that they would prefer to work in the sphere of Agriculture, however they expect to work in another sphere. The explanations they gave were (translation from Spanish): "It depends on the situation in the country", "A dream which probably won't come true", "Bio sphere", two interviewees didn't leave comments. These 2% of interviewees, who are willing to work in the Agricultural sphere, but will work in another sphere represent a group of individuals, who might work in the Agriculture if they receive sufficient information on the Industry opportunities and perspectives. In case of this potential entrepreneurs informing might be a sufficient instrument in Agricultural entrepreneurship promotion.

Another background information, which might be useful, is the family "Level of Income". The interviewees were asked to evaluate their family's level of income from 1 (Poor) to 7 (Rich). As a result, the range of answered varied from 1 to 6. In order to see whether the level of income influence the Attractiveness of Agro sphere, the data of Control Group was used and divided into two groups: Group 1 – those who ranked income from 4 to 6 and Group 2 – those who ranked the income from 1 to 3. Group 1 consisted of 119 interviewees, while Group 2 contained only 14 participants, due to a small amount of participants in Group 2, the Groups were not compared.

Another significant source of information is the city of birth of interviewees. 140 interviewees, 55% of experiment participants were from Barcelona, 77 (30%) are from small cities in Spain (such as Sant Carles de la Rapita, Palma de Mallorca, Granolles, Girona, Sabadell, Santa Coloma, etc.) and 36 (15%) interviewees are from other countries (from cities of Netherlands, Belgium, China, South Korea). The data was considered separately in two groups: Control and Treatment. The data in each group was divided into two: interviewees who were born in Barcelona and interviewees who were born in small cities. The mean values of Attractiveness of the Agricultural sphere are presented in the following table:

Table 9. Mean Attractiveness of Agricultural Sphere (Barcelona and Small Cities).

	Barcelona	Small Cities	Difference
Control Group	18,73	30,85	12,12
Treatment Group	36,64	52,21	15,57
Difference	17,91	21,36	

The t.test shows that the difference in mean values of Agricultural sphere Attractiveness in Barcelona and Small Cities (12,12 points in Control and 15,57 points in Treatment) is statistically significant in both cases: t = -2.2159, p-value = 0.02974 In Control Group and t=-2,1075, p-value=0,03898 in Treatment Group.

In both Treatment and Control Groups interviewees from small cities in Spain find Agricultural sphere more attractive than the interviewees from Barcelona. The Treatment doesn't decrease the difference in mean values between the groups from Barcelona and small cities.

The higher Attractiveness of the Agricultural sphere in small cities group might be connected with better knowledge about the sphere and better awareness about the industry opportunities and possible directions of business development. Or the Agricultural sphere of business might be more attractive on average for the interviewees from the smaller cities due to its non-financial benefits such as opportunity to live in the countryside, fresh and healthy food, etc. (Part I of the Thesis contains more detailed list of agri-sphere non-financial benefits, listed in the existing literature).

We can further divide the group of interviewees, which represent small cities to participants coming from rural and urban areas, applying the OECD classification, according to which the area is urban if the population of the area has at least 50 000 inhabitants and rural otherwise (OECD, 2012). As a result, 59% of interviewees represent urban areas, while the other 41% represent rural area. These two subgroups represent the following results: the average Attractiveness of the sphere of Agriculture 34 and 44 in urban and rural subgroups respectively, what shows that the Agricultural sphere attractiveness is greater for people from rural areas.

Other considerable differences between the subgroups are represented by the difference in average importance scores of criteria Esteem (75 for urban and 65 for rural subgroups) and Belonging (22 for urban and 35 for rural subgroups). The criterion Income received very similar average importance scores in two subgroups (83 in urban and 82,5 in rural subgroups). The results show the possibility that the interviewees from rural areas value more such criterion as Belonging and care less about the respect and recognition by other people (criterion Esteem), however, due to the fact that swing weighting procedure was applied in the experiment and interviewees were not evaluating the absolute value of criteria importance, additional research is needed on the differences in perceived attractiveness of agricultural sphere by individuals, divided into groups according to their geographical provenance.

4.6 Agriculture and Alternatives.

As the application of the MCDA approach assumes comparison of the Agricultural sphere of entrepreneurship with alternatives, the experiment results contain information on all spheres, considered by the experiment participants. Additional information can be gained from analysis of the data on the Agricultural sphere alternatives.

Table 10 presents the average scores, assigned to the six alternatives on all criteria in Treatment and Control Groups.

Table 10. Alternatives Performance in Treatment and Control Groups.

	Construction	Goods	Services	Agro	Finance	Technology
Treatment						
Attractiveness	42,89	62,35	60,07	44,93	73,65	66,84
Income	59,55	59,34	55,75	23,3	82,73	84,61
Freedom	41,28	56,91	49,95	57,08	43,66	71,37
Esteem	50,69	49,39	58,23	41,49	67,68	80,68
Realisation	42,37	50,14	58,18	56,73	60,89	71,07
Social	48,56	56,34	70,92	70,72	47,77	75,65
Belonging	57,69	55,8	60,79	39,33	63,74	79,88
Control						
Attractiveness	41,34	68,46	63,08	23,8	69,66	74,55
Income	55,08	56,62	53,75	16,99	84,23	87,53
Freedom	41,86	59,47	51,29	44,05	44,92	71,02
Esteem	48,61	52,14	65,1	23,16	76,84	83,2
Realisation	44,34	55,9	60,26	36,83	67,65	80,77
Social	47,83	52,61	74,02	54,06	54,47	82,34
Belonging	54,29	54,92	62,97	34,56	69,61	82,7

From the Table 10 we can see the average performance of each alternative on each criterion in Treatment and Control Groups. The interesting difference in two experiment groups is that in the Treatment Group the alternative with the highest average attractiveness is Finance (73,65 average score), while in the Control Group it's the Technology (74,55 average score). The spheres of Technology and Finance demonstrate the highest average scores on the majority of criteria in both Treatment and Control Groups. However, on criterion Freedom the sphere of Finance demonstrate the second lowest result in both Treatment (43,66) and Control (44,92),

what might indicate that the experiment participants expect that the sphere of Finance would demonstrate one of the highest Income levels among other business sphere but at the same time would provide one of the lowest levels of Freedom. Also the sphere of Finance has one of the lowest scores on criterion Social Preference: in Control Group it's 54,47 (the lowest score of 47,83 has the sphere of Construction) and in Treatment Group it's the lowest among all six spheres, 47,77 points. The sphere of Technology has the highest average score on all criteria in both Treatment and Control Groups. That might be partly connected with a great attention to the sphere in Media and existence of well-known, successful and respected representatives of the Technological sphere, such as Steve Jobs, Bill Gates and others.

From the alternatives average scores analysis we can conclude that the major interest of business students lies in the spheres of Finance and Technology. The Agricultural sphere has the lowest average level of Attractiveness in Control Group (23,8 points) and the second lowest average level of Attractiveness in the Treatment Group (44,93). The change of the average score result from the sixth place to the fifth place in the list again demonstrates the significant positive effect of the Treatment on the Agricultural sphere perception.

Another useful source of information could be the correlation between the Attractiveness score of each alternative and its performance on the criteria.

Table 11. Correlation Between Alternative Attractiveness and Performance.

	Construction	Goods	Services	Agro	Finance	Technology
Treatment						
Income	0,16	0,37	0,31	0,16	0,26	0,33
Freedom	0,03	0,29	0,15	0,14	0,18	0,24
Esteem	0,25	0,4	0,19	0,42	0,24	0,34
Realisation	0,45	0,43	0,31	0,54	0,56	0,58
Social	0,25	0,31	0,12	0,2	0,18	0,34
Belonging	0,24	0,34	0,14	0,19	0,25	0,44
Control						
Income	0,36	0,53	0,39	0,09	0,36	0,22
Freedom	0,25	0,03	0,06	0,16	0,15	0,13
Esteem	0,41	0,35	0,3	0,24	0,33	0,19
Realisation	0,38	0,26	0,42	0,34	0,37	0,37
Social	0,24	0,28	0,03	0,16	0,23	0,1
Belonging	0,3	0,28	0,19	0,06	0,31	0,02

From the Table 11 we can see that the correlations between the business spheres Attractiveness and performance on criteria is different in Control and Treatment Groups. The correlation with alternative performance on criterion Income has decreased in the majority of business spheres (in Treatment Group compared to the Control), while the correlation between alternatives Attractiveness and performance on criteria Realisation increased. This result might indicate that the Treatment Effect attracts greater attention of the decision makers to the non-pecuniary benefits of entrepreneurship, such as Self-Realisation and as we can see from the results, it effects the perception of all business spheres, as the correlation increases in case of five out of six alternatives (the only sphere which has demonstrated the opposite result is the sphere of Services, which demonstrated higher correlation with criteria Social Preference and Freedom).

Also the correlation between Attractiveness and performance on criterion Social Preferences has increased in cases of all alternatives except Finance. The correlation table analysis might be another indicator of the Treatment Effect on the perceived importance of pecuniary and non-pecuniary criteria in entrepreneurial decision: in the Treatment Group the correlation of level of Attractiveness and non-pecuniary factors increases while the correlation between Attractiveness and financial criterion Income decreases.

4.7 Regression models.

The MCDA framework was used in the experiment design and can be presented as a following Multicriteria Additive Value Model (the *i* which stands for alternative was substituted by *a*):

$$V_a = \sum_{j \epsilon J} w_j \, v_{a,j,}$$

The experiment participants assigned scores to all elements of the model: they evaluated the performance of every alternative a on each of the criterion j ($v_{a,j,}$), they also assigned weights to all criteria w_j and evaluated the attractiveness of all alternatives V_a.

The data received allows to create a regression model in order to see which criteria influence the outcome variable, to evaluate which of the Groups, Control or Treatment, can provide higher goodness of fit measure (R^2). The model would also be used in order to check which background data influence the outcome variable, Attractiveness of the Agricultural sphere.

The MCDA Additive Value Model, based on the criteria classification, created in the Part II of the Thesis, can be presented as follows:

$$V_a = w_1 v_{a,1} + w_2 v_{a,2} + w_3 v_{a,3} + w_4 v_{a,4} + w_5 v_{a,5} + w_6 v_{a,6}$$

$v_{a,1}$ – partial value of the option in terms of criterion “Realisation”.
$v_{a,2}$ – partial value of the option in terms of criterion “Belonging”.
$v_{a,3}$– partial value of the option in terms of criterion “Esteem”.
$v_{a,4}$ – partial value of the option in terms of criterion “Freedom”.
$v_{a,5}$ – partial value of the option in terms of criterion “Income”.
$v_{a,6}$ – partial value of the option in terms of criterion “Social Preference”.

If the Decision Maker would be considered from the perspective of neoclassical economics, in other words if he/she is considered as homo economicus, consistently rational, unbiased and always choosing the optimal alternative (Morgan, 2006), then the level of Attractiveness of the

alternative a, the V_a would be equal to the sum of alternative performance under each of the criterion multiplied by the weight of the criteria. The value of the alternative "Agriculture" would be equal to the cumulative scores given to the business sphere on every criterion multiplied by the weight of the criterion. That would be true, however, only if the list of the criteria, would be created by the Decision Maker and if the DM would be an absolutely rational and unbiased homo economicus.

In reality, the MCDA approach is used in helping in decision making process and in alternatives assessment. Part I and Part II of the Thesis clearly demonstrated that the choice of the Decision Maker is often biased. Lack of information, inaccurate perception of the business spheres opportunities and perspectives as well as overconfidence and overoptimism are some of the reasons of biased choice. Even applying MCDA, the Decision Maker gives biased scores to the alternatives. Excessive intercorrelation of criteria scores is one of the reasons. The correlation is positive when the criteria are characterised by the same direction of preference and negative otherwise (Morton, 2009). Another reason is the fact that Decision Makers often can't make a full list of criteria, which are important for him/her in decision making process. When interviewees are asked to list their objectives in decision problem, the number of criteria, which they mention, is much smaller than the number of objectives, which they can identify as important to them from a list (Bond, 2007). Also for the majority of Decision Makers, weighting criteria is the most cognitively demanding part of the MCDA process (Morton, 2009). Weight judgements depend on the structure of the value tree. If a criterion is subdivided into subcomponents, the total weight assigned to the criterion tends to be increased (Weber, 1988).

The experiment participants evaluated the suggested alternatives on six criteria, which they were presented and explained. They've also evaluated the weights of the criteria. The value of each of the alternative can be calculated based on the experiment results. However, due to the reasons, discussed in the paragraph "Experiment Limitations and Consistency Check.", due to the fact that interviewees are not personally interested in the results of the experiment and don't create their own list of criteria, but evaluate the alternatives on the suggested six criteria, the final value received (calculated as V_a) is expected to correlate with the Attractiveness score, which the experiment participant assigns to the business sphere, however the attempt to fit a regression model to the observed data won't show a coefficient of determination (R^2) as high as in case of it's application in some spheres of Finance, for example. Still I expect that R^2 would have a significant value, taking into account that "any field that attempts to predict

human behavior, such as psychology, typically has R-squared values lower than 50%." (Frost, 2013)

The linear regression model which can be based on the MCDA Additive Value Model might be:

$$V_i = \beta_0 + \beta_1 w_{i,1} v_{i,1} + \beta_2 w_{i,2} v_{i,2} + \beta_3 w_{i,3} v_{i,3} + \beta_4 w_{i,4} v_{i,4} + + \beta_5 w_{i,5} v_{i,5} + \beta_6 w_{i,6} v_{i,6} + \epsilon_i$$

V_i is the response variable, Attractiveness of Agro-sphere for individual *i*.

$v_{i,1}$, $v_{i,2}$, … represent the scores assigned by individual *i* to the Agricultural sphere of entrepreneurship on the criteria 1 to 6 (Realisation, Belonging, etc.)

$w_{i,1}$, $w_{i,2}$, … are the criteria weights, evalauted by the experiment participant i applying the swing weighting procedure.

ϵ_i – unobserved error term.

That is the model, which includes all criteria scores: Realisation, Belonging, Esteem, Freedom, Income and Social Preference. The Minitab and R Studio softwares were used in linear regression model creation.

The regression models will be created seperately for the Control and Treatment Groups data.

Firstly, I've created the regression model for the Control Group Data, the model summary can be presented as follows:

Table 11. Six Variables Model Summary. Control Group.

	Coef	SE Coef	T-Value	P-Value	VIF
Constant	9,35	4,20	2,23	0,028	
Belonging	-0,016	0,110	-0,15	0,884	1,08
Social	0,1254	0,0780	1,61	0,110	1,04
Realisation	0,2612	0,0733	3,57	0,001	1,28
Esteem	0,0837	0,0934	0,90	0,372	1,20
Freedom	0,0701	0,0738	0,95	0,344	1,11
Income	-0,0374	0,0997	-0,38	0,708	1,10

The model R-squared is 17,27%, while R-squared adjusted is 13,33%. The goodness-of-fit measure seems low, taking into account that all criteria were included in the model. However, as the P value for the overall F-test is less than the significance level (0,000), we can conclude that the R-squared value is significantly different from zero.

As the explanatory variables can be positively correlated, one can expect that the multicollinearity issue might appear in the model. That is the correlation between predictor variables, which increases the standard errors of the coefficients, what can create a biased perception of variable insignificance. However, as can be seen from the model results, all variance inflation factors (VIF) are close to 1, what indicates the absence of correlation among the predictors in the model what means that the model doesn't face the problem of multicollinearity.

The terms p-values show that Belonging, Social Preference, Esteem, Freedom and Income are probably not significant for the model.

The regression analysis also shows the Lack-of-fit p-value greater than the significance level 0,05 (p-value = 0,124) what means that the test doesn't detect any lack-of-fit and the model fits the data accurately.

From the results we can conclude that, despite of the low R-squared the model correctly specifies the relationships between the response and predictors. The next step of the data analysis would be the model based on the Treatment Group data. The results of the Treatment Group data linear model can be presented as follows:

Table 12. Six Variables Model Summary. Treatment Group.

	Coef	SE Coef	T-Value	P-Value	VIF
Constant	12,38	5,90	2,10	0,038	
Belonging	0,205	0,130	1,57	0,119	1,35
Social	0,2086	0,0878	2,38	0,019	1,05
Realisation	0,3861	0,0803	4,81	0,000	1,24
Esteem	0,107	0,100	1,06	0,290	1,17
Freedom	0,0282	0,0852	0,33	0,741	1,08
Income	0,006	0,115	0,05	0,959	1,21

The model R-squared is 33,96%, while R-squared adjusted is 30,46% and there is no lack-of-fit.

The overall F-test p-value is 0,000 (less than the significance level), what indicates that the R-squared value is significantly different from zero. VIF values are close to 1, so there is no problem of multicollinearity. The p-values show that the Esteem, Freedom, Income and Belonging variables might be not needed in the model. The p-value results on criterion "Income" (0,959) might be used as an additional prove that Income performance of the Agricultural Industry doesn't explain the Attractiveness level of the Agricultural sphere. In the

Treatment Group data, as the p-value for Realisation and Social Preference variables is less than 0.05, we reject the null hypothesis that $\beta = 0$. Hence, there is a significant relationship between the explanatory and outcome variables in the linear regression model. In the Control Group data only the Realisation variable seems significant for the linear regression model. Variable "Realisation" also has the highest T-value what proves again the significance of the Self-Realisation as a determining factor in students' future career choice.

The Treatment Group model provides much better R-squared result than the Control Group data. That might indicate that the Treatment has a debiasing effect and experiment participants evaluated the alternatives more accurately. However, this conclusion can't be made without additional investigation.

The relationship between the outcome variable V_i and explanatory variables can be characterised by correlation of different magnitude as all the explanatory variables demonstrate values, which the alternatives can provide. In order to investigate more the reasons of higher R-squared in case of the Treatment Group data, I've created a table of correlation between the outcome variable V_i (Attractiveness of the Agricultural sphere) and explanatory variables $v_{i,j}$ for Control and Treatment Groups data.

Table 13. Correlation Between Outcome and Explanatory Variables.

	Treatment	Control
Income	0,16	0,09
Freedom	0,14	0,16
Esteem	0,42	0,24
Social	0,2	0,16
Realisation	0,54	0,34
Belonging	0,18	0,06

We can see from the table that in the Treatment Group data the correlation between the outcome and explanatory variables has significantly increased (in case of all variables except Freedom). From the correlation results we can conclude that the interconnection between the criteria scores assigned to the Alternative and its Attractiveness score has significantly improved. So in the Treatment Group the outcome variable is determined by the explanatory variable to a greater extent. That might be an indicator of a debiasing effect of the Treatment.

In other words, the Treatment helps in identifying the attractiveness level of an alternative more accurately.

In order to use both Control and Treatment data in the regression model a dummy variable "Treatment" could be used, but as the model, based on the Cotrol Group data demostrates much lower R squared, and there is an assumption that the Control Group results for the Agricultural sphere are biased, than only Treatment data would be used in Regression model.

The next step of the model is to decrease the number of explanatory variables as from the p-values we can see that variables Esteem, Freedom, Income and Belonging can be deleated one by one from the model till all the variables will have significant p-values (lower than 0,05).

The model reduction leads to a model with three explanatory variables (Belonging, Social Preference and Realisation). The explanatory power of the model didn't decrease (R squared = 33,19%) and R squared adjusted improved to 31,46%.

Table 14. Three Variables Model Summary. Treatment Group.

	Coef	SE Coef	T-Value	P-Value	VIF
Constant	14,54	4,96	2,93	0,004	
Belonging	0,231	0,118	1,95	0,053	1,13
Social	0,2115	0,0870	2,43	0,017	1,04
Realisation	0,4137	0,0757	5,46	0,000	1,12

The model showed seven unusual observations, including two outliers (Appendix V).

The standard error coefficient of the Realisation is the smallest so the model is able to estimate the coefficient for factor Realisation with greater precision, than for the other two factors. The p-values of the variables Social Preference and Realisation are lower than 0,05, from what we can conclude that corresponding $\beta \neq 0$, however the p-value of the variable Belonging is 0,053, which means that with 0,05 significance level the β of the term Belonging is equal to zero. As the p-value is close to 0,05 we can assume that with a bigger sample the p-value of Belonging would decrease and the regression model would include all the 3 explanatory variables.

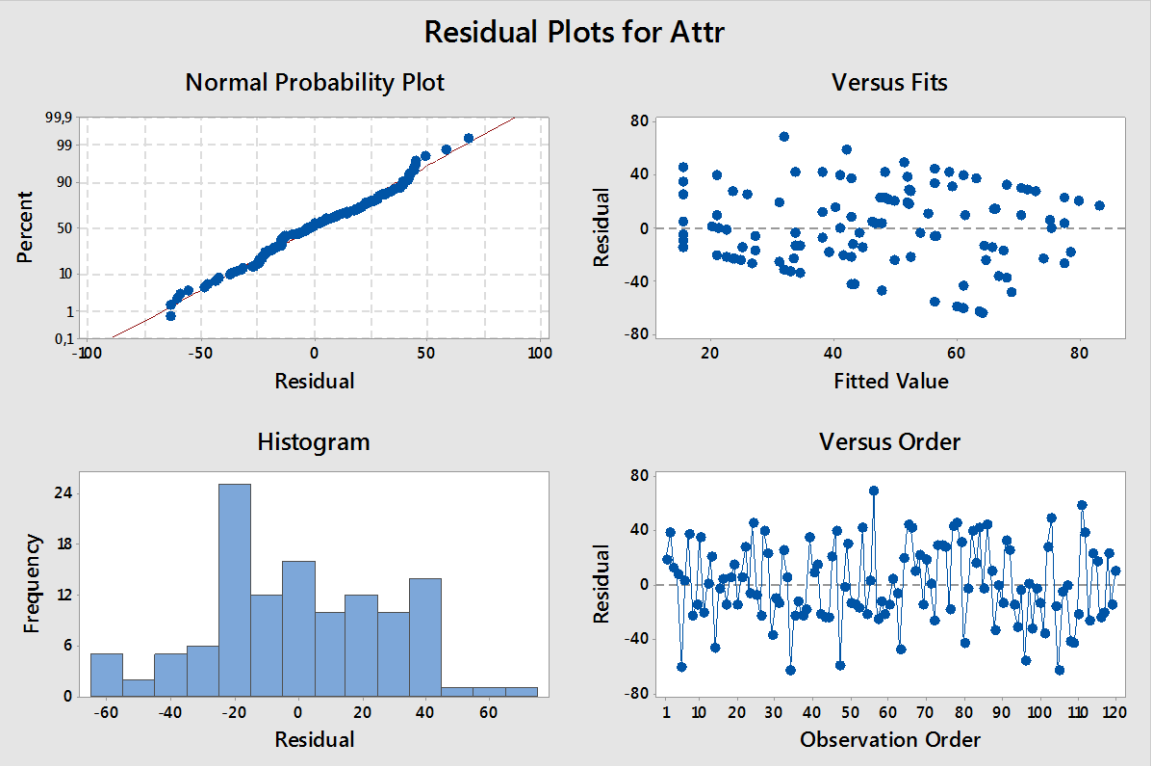
If we reduce the model to two explanatory variables, Social Preference and Realisation, we'll receive R-squared equal to 30,99% and R-squared adjusted 29,81%.

Table 15. Two Variables Model Summary. Treatment Group.

	Coef	*SE Coef*	*T-Value*	*P-Value*	*VIF*
Constant	15,20	5,01	3,03	0,003	
Social	0,4568	0,0733	6,23	0,000	1,02
Realisation	0,2350	0,0872	2,69	0,008	1,02

In order to check whether the model is adequate and meets the regression assumptions, the residuals plots was created.

Picture 3. Residual Plots.



Normal probability plot doesn't show any considerable curve on the graph so the errors are normally distributed. There is also no pattern in the Residual Versus Order plot, the residuals fluctuate in a random pattern around zero due to what we can conclude that the errors are independent of each other. The Residual Versus Fit plot shape can be explained by the data peculiarities: the attractiveness might be from 0 to 100, so the residuals are randomly distributed.

That could be a final step of the regression model modification, but in order to gain additional information on the experiment participants preferences formation, an alternative regression model was created on the base of the Treatment Group data.

4.7.1 Alternatives Dependent Regression Model.

I assume that the model can provide better predictions. The formula $V_i = \sum_{j \epsilon J} w_j \, v_{i,j}$ where V_i is unknown helps to identify the optimal option according to the Decision Maker's preferences. It also shows the worst option and the ranking of other alternatives as well as the magnitude of preferences. The final score of each alternative doesn't depend on the scores of other alternatives. However, if a Decision Maker would be asked to evaluate Attractiveness of the alternatives, the Attractiveness scores of alternatives might be influenced by the other alternatives, dominating or dominated by the assessed alternative.

For example, if alternative A receives 100 points on a criterion, alternative B receives 50 and alternative C receives 0. The scores of other alternatives between A and C shouldn't depend on for the final score, which alternative B would receive. Let's consider 2 cases: there are two additional alternatives E and F. The scores of E and F on the criterion might be 90 and 95 respectively, or they might be 5 and 10. In the first case, the Alternative B might become less attractive for the Decision Maker, because of the appearance of two alternatives which strongly dominate B on the criterion. In the second case, alternative E and F can make the alternative B more attractive. On the one hand a change in B alternative preference might be considered as a bias, influenced by the dominating alternatives (in case one) or by the dominated alternatives (in case two). But, considering the data received in the experiment I can make an assumption that the "Attractiveness" score, assigned by the experiment participants, could be influenced by the dominating and dominated alternatives, as a result the regression model can be built on a modified data, which would take into account the alternatives score. If the regression model would show better R-squared results, that might indicate that the Attractiveness score is alternatives dependent.

The two alternative formulas, which take into account scores of every option, were created.

$$V_i = \beta_0 + \sum_{j=1}^{6} \frac{v_{1,j,i}}{\frac{1}{100}\sum_{a=1}^{6} v_{a,i,j}} \, w_{j,i} \, \beta_j + \epsilon_i \qquad (1)$$

or

$$V_i = \beta_0 + \sum_{j=1}^{6} \frac{v_{1,j} w_j}{\frac{1}{100}\sum_{a=1}^{6} v_{a,i,j} w_{j,i}} \, \beta_j + \epsilon_i \qquad (2)$$

V_i is the attractiveness of alternative "Agriculture" for individual *i*, $v_{1,j,i}$ is the score assigned to alternative "Agriculture" on criterion *j*, by individual *i*, $v_{a,i,j}$ is the score assigned to alternative *a* on criterion *j*, $w_{j,i}$ is the weight of criterion *j*, calculated applying the swing weighting procedure.

The first formula (1) calculates the score of each alternative on each criterion as a percentage of the sum of scores assigned to all alternatives. The second formula (2) calculates the score of alternative on criterion j multiplied by the weight of the criterion j as a percentage of the total criteria weight adjusted scores of all alternatives.

The linear regression model, based on the first formula demonstrate better results: R-squared 39% and Adjusted R-squared 37%.

The model based on the second formula demonstrates: R squared equal to 40,84% and R squared adjusted 37,70%. The goodness of fit measure R^2 adjusted shows that higher proportion of the sample variation in V_1 is explained by the new model.

Coefficients summary of the regression model based on the second formula demonstrates us that Income and Social Preferences p values are significantly greater than 0,05, due to what we can conclude that they are not significant for this regression model. The VIF values are much lower than 5 and are close to 1, which means that the possible correlation between the explanatory variables is not significant and we are not facing the problem of multicollinearity.

Table 16. Regression Model Six Modified Variables (Treatment Group, Formula (2)).

	Coef	SE Coef	T-Value	P-Value	VIF
Constant	4,28	6,21	0,69	0,492	
Income	0,270	0,349	0,77	0,441	1,09
Freedom	0,370	0,194	1,91	0,059	1,03
Esteem	0,438	0,224	1,95	0,053	1,12
Social	0,250	0,220	1,14	0,257	1,06
Realisation	1,241	0,233	5,32	0,000	1,26
Belonging	0,651	0,298	2,19	0,031	1,26

After deleating two variables in two steps the R squared slightly decreased to 39,88%, while R squared adjusted didn't change (37,79%) and the only p-value slightly higher than 0,05 is Freedom.

Table 17. Regression Model Four Modified Variables (Treatment Group, Formula (2)).

	Coef	SE Coef	T-Value	P-Value	VIF
Constant	8,49	5,38	1,58	0,118	
Freedom	0,379	0,193	1,96	0,053	1,02
Esteem	0,491	0,221	2,22	0,028	1,08
Realisation	1,255	0,229	5,49	0,000	1,21
Belonging	0,699	0,288	2,43	0,017	1,18

If we eliminate Freedom from the model the R-squared adjusted would slightly decrease to 36,27% and the model summary would be:

Table 18. Regression Model Three Modified Variables (Treatment Group, Formula (2)).

	Coef	SE Coef	T-Value	P-Value
Constant	14.4718	4.4848	3.227	0.00163
Esteem	0.5294	0.2225	2.380	3.65e-07
Realisation	1.2493	0.2315	5.396	0.01894
Belonging	0.7404	0.2904	2.549	0.01210

The R-squared adjusted of the regression model based on the modified formula is 37,79% (four modified variables model), while the R-squared adjusted of the regression model, based on the basic formula is significantly lower (31,46%). The reasons of the R-sqaured diversity might be different. The experiment participants might be biased due to the effect of other alternatives scores on the Agriculture Attractiveness score. However, the Attractiveness score was assigned by the experiment participants before the evaluation of alternatives performance on the criteria, what decreases the probability of this explanation. On the other hand, the modified calculation might provide more accurate results in terms of the perceived Attractiveness of the Agricultural sphere. Additional research is needed to investigate the applicability of the Formulas.

4.7.2 Regression Model with Interaction Term.

Another factor in the model might be the interactions between predictors. Interaction assumes that the effect of one factor depends on the level of the other factor. Interaction plot might be used to visualise possible interactions.

In order to find out whether certain interaction terms should be added to the model I'm using ANOVA and the only interaction with a significantly small p-value is between Esteem and Realisation.

Table 19. Analysis of Variance.

	DF	F-Value	P-Value
Regression	3	22,39	0,000
Realisation	1	39,36	0,000
Esteem	1	10,70	0,001
Realis*Esteem	1	4,17	0,043

Adding the Realisation*Esteem interaction into the model gives us a higher R-square adjusted (39,73%) and a significant p-value for the explanatory variable Freedom.

Table 20. Regression Model with Interactions (Treatment Group).

	Coef	SE Coef	T-Value	P-Value	VIF
Constant	3,14	5,84	0,54	0,592	
Freedom	0,382	0,190	2,00	0,047	1,02
Esteem	1,008	0,322	3,13	0,002	2,39
Realisation	1,669	0,295	5,66	0,000	2,07
Belonging	0,706	0,283	2,49	0,014	1,18
Esteem*Realis	0,706	0,0154	-2,17	0,032	3,71

Also the VIF of the explanatory variables increased and 3,71 VIF of the interaction term indicates correlation between explanatory variables. The model's Lack-of-Fit p-value is 0,002 what indicates that the test detects a lack-of-fit and the model doesn't fit the data accurately. In other words, the model with interaction doesn't fit the data and doesn't represent an optimal model.

4.7.3 Regression Model with Background Data.

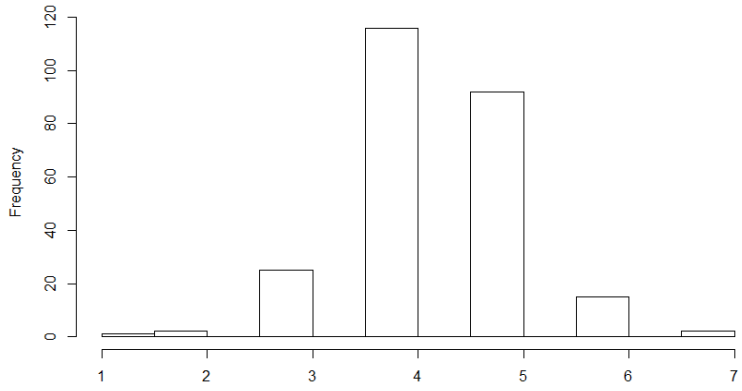
The last part of the questionnaire contained interviewees' background information on age, gender, family income, parents' career and education, organic food consumption and career plans.

While Gender, presence of Entrepreneurial Relatives, Entrepreneurship Consideration are binary variables, all the other should be transformed into dummies.

City of Origin and Career plans are qualitative data. I won't consider career plans in the regression model as the only way to transform it into a dummy is to divide individuals to those planning to work in agriculture and those not planning to work in agriculture. The City of Origin was transformed into four values: 1 – Barcelona, 2 – Another big city in Spain, 3 – A small city in Spain, 4 – city in another country. The majority of participants, 140 participants (55%), are from Barcelona, 77 (30%) are from small cities in Spain and 36 (15%) interviewees are from other countries.

The age threshold, which was chosen, is 21 years old. This age threshold is commonly used in laws and regulations and it divides our data to 2 groups of similar size (150 participants (59%) are 21 or younger, 103 (49%) are older than 21).

The Income Histogram looks as follows:



As we can see, majority of experiment participants declared that their family income could be rated as 4 on a 1-7 scale. The Income threshold was chosen as 4, which divides the data to two similar in size groups (109 (43%) participants, who declared their family income higher than 4 and 144 (57%) who declared their family income as 4 or lower).

The Organic Food variable was made a dummy through dividing the participants to those consuming organic food mostly or sometimes, 171 participants 67,6% of the experiment sample, and not consuming organic food (82 participants, 32,4%).

The regression model was based on the following variables: income, entrepreneurial parents, age, city of origin (from Barcelona or not from Barcelona) and whether the interviewee consider entrepreneurial career in future. The R-squared adjusted is equal to 15%.

If we create the linear regression models based on the Treatment and Control data for all outcome variables: Attractiveness of the sphere of Agriculture, Services, Technologies, Finance, Constructions and Goods; we'll receive the following R-squared and R squared adjusted.

Table 21. Regression models for all Outcome Variables.

	Treatment		Control	
	R-sq	R-sq adj	R-sq	R-sq adj
Agro	20,78	15	14,87	9,37
Services	14,27	8	8,37	2,46
Constructions	11	4,5	7,8	1,8
Technologies	9,3	2,7	10,4	4,68
Finance	4	2	5,14	0,9
Goods	5	0,9	10	4

The R-squared of the models, based on other business spheres show lower R-squared, that might be connected with the fact that the background data on organic food consumption and city of origin has higher effect on the attitude to the sphere of Agriculture, than on other spheres.

Another observation which can be made is that the Treatment Group shows greater R-squared and R-squared adjusted for the Agricultural sphere outcome variable. Also, as it was shown in the previous paragraphs, the Treatment Group data demonstrate higher correlation between the explanatory and outcome variable.

A possible explanation might be that the Treatment has certain debiasing effect on the evaluation of Agricultural sphere attractiveness, as it improves the predictability of the regression models based on both criteria evaluation and background data.

Returning back to the regression model, based on the Agricultural sphere outcome variable, the model summary showed high p-values for variables Income, Age and Consider

Entrepreneurship (0,481, 0,553 and 0,388 respectively) what indicates that β of these variables is equal to zero. The model based on the remaining variables can be presented as follows:

Table 22. Regression Model with Background Data (Treatment Group).

	Coef	SE Coef	T-Value	P-Value	VIF
Constant	34,95	6,99	5,00	0,000	
Organic	15,17	6,60	2,30	0,023	1,04
Entr. Parents	12,83	5,97	2,15	0,034	1,01
City	-14,13	6,02	-2,35	0,021	1,03

R squared is equal to 13,77%, R-squared adjusted 11,54%. The R squared means that 11,54% of experiment results can be explained by the background of the experiment participants: by the consumption of organic products, parents entrepreneurial background and city of origin.

The previous chapters also demonstrated the influence of the city of origin and organic food consumption on the attractiveness of Agricultural sphere of Entrepreneurship.

If we combine the explanatory variables from two regression models: "Alternatives Dependent Regression Model." and "Regression Model with Background Data." we can improve the R-squared adjusted result.

After adding all the dummy variables into the "Alternatives Dependent Regression Model", the model summary demonstrated increase in R-squared adjusted (44,39%). The model consists of nine variables: Agricultural sphere performance on criteria Freedom, Esteem, Realisation and Belonging (calculated by Formula (2) in "Alternatives Dependent Regression Model.") and background data variables: City of origin, Family Income, Gender, Entrepreneurial parents and Organic consumption. The p-value of variables City of origin, Freedom, Organic and Gender are greater than 0,05 (0,19; 0,055; 0,062 and 0,073 respectively). After deleting the variable City of Origin, the p-values of all variables became less then 0,05. The regression model can be presented as follows.

Table 23. Regression Model with Modified Variables and Background Data (Treatment Group).

	Coef	SE Coef	T-Value	P-Value	VIF
Constant	-3,07	6,49	-0,47	0,637	
Freedom	0,385	0,183	2,11	0,038	1,03
Esteem	0,442	0,209	2,11	0,037	1,10
Realisation	1,233	0,219	5,62	0,000	1,24
Belonging	0,649	0,277	2,35	0,021	1,22
Organic	10,76	5,26	2,05	0,043	1,05
Entrepr par	10,52	4,87	2,16	0,033	1,07
Income	-11,37	5,03	-2,26	0,026	1,10
Gender	9,63	4,76	2,02	0,046	1,01

The R-squared of the model is 47,81%, R-squared adjusted is 44,01%. The low VIFs indicate absence of multicollinearity problem.

The Three variables model in paragraph "Alternatives Dependent Regression Model." includes three explanatory variables (Esteem, Realisation and Belonging) and the R-squared adjusted is 37,79%. The R-squared adjusted of the created regression model with eight explanatory variables is 44,01%. However, if we'll delete the explanatory variable Freedom from the model with eight explanatory variables, the R-squared adjusted would be 42,28%. In other words, if we compare the two regression model, one includes three variables Esteem, Realisation and Belonging and the second one, which besides these three variables also contains the background data, the R-squared of the second model is 4,49% higher.

From this slight increase in model predictability (and a significant increase in the number of explanatory variables) we can conclude that the explanatory variables Freedom, Esteem and Realisation provide good predictions of the outcome variable and the background data doesn't provide a significant improvement.

4.7.4 The Entrepreneurial Decision Prediction.

As it was mentioned before, the experiment results on alternatives performance and criteria weights correlate with the Attractiveness score of the alternatives, assigned directly by the experiment participants. One of the ways in which the data on other alternatives can be applied is analysis of the predictability of the most attractive option. In other words, the student assigns a score 100 to the sphere of entrepreneurship which seems to him/her the most attractive. The total score of the alternative, which can be calculated as a sum of all the scores of alternative multiplied by the criteria weights, can be presented as $V_a = \sum_{j \epsilon J} w_j \, v_{a,j}$. The question is the number of cases, in which the highest Attractiveness score assigned to alternative corresponds to the alternative, which has the highest cumulative value, calculated by the MCDA formula.

According to the experiment results, the Industry, to which the experiment participants assigns the highest score can be predicted by the alternative performance results in 132 cases out of 253, in other words in 52% of the results. The results can be also presented for the Control and Treatment Groups:

Table 24. Predicted Highest Score of Attractiveness.

	Predicted Highest Score	
	Number	Percentage
Treatment	68	56,6%
Control	64	48,12%
Total	132	52%

As we can see from the results, the percentage of correct predictions of the alternative with the highest level of attractiveness is slightly higher in the Treatment Group, what might be another indicator of the debiasing effect of the Treatment on alternatives assessment. The score, calculated on the base of evaluation of alternatives on the six attributes (suggested in Part II as entrepreneurial decision criteria) provides good predictions of the highest level of attractiveness among alternatives, what confirms the applicability of the Part II classification of Entrepreneurship Determinants.

Another source of information is the qualitative data, provided by the experiment participants as answers to the open questions: “In which sector do you expect to work?” and “In which sector would you like to work?” The experiment participants were asked to imagine that they are going to become entrepreneurs and were asked to evaluate six business spheres. In reality the students might be consider both entrepreneurial career and career in a company or only career in a company. However, according to another question in the experiment, the majority of the participants are considering entrepreneurial career. The Table 25 presents the number of experiment participants, who wrote that they expected to work in the sector, which they’ve assigned the highest attractiveness score.

Table 25. Expected Work Sphere and Sector Attractiveness.

	Predicted Highest Score	
	Number	Percentage
Treatment	79	65,8%
Control	78	58,6%
Total	157	62%

As we can see from the results, the majority of experiment participants expect to work in the sector, to which they’ve assigned the highest score of Attractiveness. In many cases, experiment participants wrote different business sphere, answering the questions about the sector in which they expect to work and in which they would like to work. The next question of the experiment asks them to name the reason if the two sectors are different. In comments, students are mentioning such reasons as difficulties in entering the sphere of greater interests, higher profits and growth potential of the sphere in which they expect to work, low chances of succeeding in the sphere of interest and lack of business opportunities and perspectives in the sector in which they would like to work.

The experiment results firstly attract attention to the difference between desired career development of potential entrepreneurs and their perception of opportunities and perspectives of the most attractive sphere.

Secondly, the experiment results open a new research direction, which is the research on the reasons of divergence between the desired direction of career and expected career path.

5. CONCLUSION.

The experiment on non-pecuniary method of Agricultural entrepreneurship promotion has demonstrated significant results. The Treatment Effect, based on a binary outcome variable demonstrated that the number of students who gave Agricultural sphere the highest score in the Treatment Group was 15 times more than in the Control Group. The percentage of the experiment participants who evaluated Agricultural sphere as the most attractive was 12,5%, while in the Control Group the percentage of such interviewees was 0,75%. The Average Treatment Effect, based on a continuous outcome variable, shows that the Attractiveness score, assigned to the Agricultural sphere is on average 21,12% higher in the Treatment Group, the t-test shows that the difference is statistically significant. If the outcome variable is transformed into a ranking of Agricultural sphere as one of the six suggested alternatives, the ranking in the Treatment Group shows higher chances of Agricultural sphere to by chosen by the Decision Maker.

The Treatment increases the average score of the Agricultural sphere Attractiveness and increases the perceived performance of the alternative on all criteria, presented in the experiment, what demonstrates a stable effect of the Treatment. The greatest increase in performance of the Agricultural sphere is on criteria Esteem (by 18,3 points) and Social Preference (16,7). The significant increase can be explained by the change in perception of the Agricultural sphere and debiasing effect of the Treatment. The change in perceived performance of the Industry, based on the information gained from the experiment proves the model assumption $v_{a,j} \neq v^*_{a,j}$ according to which the real performance of the sphere is often underestimated by the Decision Maker.

Dividing the data in Control and Treatment Group into subgroups based on the attractiveness score of the Agricultural sphere (50 points threshold) shows that interviewees, evaluating the Agricultural sphere as more attractive give lower importance to the criterion "Income", what proves the assumption, made in previous Parts of the Dissertation, that the importance of criteria, applied in entrepreneurial decision, is different for different groups of individuals: $w_{e,j} \neq w_{f,j} \quad \forall e \neq f$. Those experiment participants, who gave Agricultural sphere greater Attractiveness score also gave the Industry much higher scores on criteria Realisation and Esteem, while the perceived level of expected Income didn't increase to the same extent. This

result indicates that the Income is not a determining factor and has a lower importance for the Decision Makers who consider Agricultural sphere as attractive.

Experiment participants background data also provide certain important conclusions. The participants, who consume organic products rank Agricultural sphere higher than those who don't. The assumption that organic products consumers also see Agricultural sphere as more profitable wasn't confirmed by the data. Another observation is that the experiment participants from smaller cities in Spain (compared to interviewees from Barcelona) evaluated the Agricultural sphere as more attractive. Also interview participants, coming from rural areas of Spain has evaluated the Attractiveness of the Agricultural sphere higher than interviewees from other small cities in Spain.

Five interviewees out of 253 (nearly 2% of interviewees) declared that they would prefer to work in the sphere of Agriculture, however they expect to work in another sphere, due to certain reasons. These 2% of interviewees represent individuals with good business education who might become entrepreneurs in the sphere of Agriculture and should be influenced by certain factors, which might be informing or industry advertising.

The regression model, built on the data with Attractiveness of the Agricultural sphere as an outcome variable and Agro-sphere criteria performance multiplied by criteria weight as explanatory variables, shows a considerably high R-squared adjusted what indicate that the criteria classification, created in the Part II of the Dissertation, can be applied in experiments.

REFERENCES.

1. 2007. “Rural Development Programmes of Four Regions of Spain” *European Commission. Press Release Database. MEMO 07/598*
2. Bathurst, B (2014) “Young farmers: why Agriculture is booming.” *The Guardian.*
3. Becker, G. (1964). “Human capital: A theoretical and empirical analysis, with special reference to education”. *University of Chicago Press.*
4. Bond S., Kurt A. and Keeney R. (2007). “Generating objectives: can decision makers articulate what they want?” *Management Science* (in press).
5. Carrington, D., Arnett, G. (2014) “Clear differences between organic and non-organic food, study finds.” *The Guardian*.
6. Choi, C., Berger, N. (2010) “Ethics of celebrities and their increasing influence in 21st century society” *Journal of Business Ethics. No. 91 pp. 313–318*
7. Curry, D. (2003)."Farming crisis as young desert industry". *BBC*
8. Dobryagina, N. (2010) “BRAT and MCDA Approaches in Decision Making in the Sphere of Pharmacology.” *London School of Economics and Political Science.*
9. Doherty, J. (2006) “The role of higher level business education in the economic development of Madagascar” *University of Richmond.*
10. Factsheet on 2014-2020 Rural Development Programme Cataluña. *European Commission.*
11. Frost, J. (2013) “Regression analysis: how do I Interpret R-squared and assess the Goodness-of-Fit?” *Minitab.*
12. Fursdon, D. 2013. “We need to get young people excited about farming.” *The Guardian.*
13. Gurrieri, A., Lorizio, M., Stramaglia, A. (2014) “Entrepreneurship networks in Italy. the role of Agriculture and Services”. *University of Foggia, Italy.*
14. Hegar, K. (2012) “Modern human relations at work”. *South-Western, Cengage Learning.*
15. http://www.forbes.com/global2000/list/#tab:overall
16. http://www.theconstructionindex.co.uk/market-data/top-100-construction-companies/2015
17. Kotler, N. (1990). “Sharing innovation. Global perspective on food, agriculture and rural development”. Smithsonian Institutions.

18. Kurek, S., Rachwal, T. (2009) "The role of business education in the development of entrepreneurship in the Member States of the European Union." *EUROPA XXI Vol. 19, pp. 127-142.*

19. Leavy, J., Hossain, N. (2014) "Who wants to farm? Youth aspirations, opportunities and rising food prices". *Institute Of Development Studies. Vol. 2014 No. 439.*
20. Lee, J.; Thorson, E. (2008). "The impact of celebrity-product incongruence on the effectiveness of product endorsement". *Journal of Advertising Research*. Vol. 48 No. 3

21. Milmo, C. (2014) "Snails? Farmers just can't keep up with demand from British diners." *The Independent.*

22. Morgan, M. (2006) "Economics man as model man: ideal types, idealization and caricatures" *Journal of the History of Economic Thought, Vol. 28, No. 1.*

23. Morton, A., Fasolo, B. (2009) "Behavioural decision theory for multi-criteria decision analysis: a guided tour" *Journal of the Operational Research Society. Vol. 60, pp. 268 –275.*

24. OECD 2012 "Redefining "Urban": A New Way to Measure Metropolitan Areas." *OECD Publishing. Paris.*
25. Ortony, A., Gerald, C., Collins, A. (1990). "The cognitive structure of emotions". *Cambridge University Press. p. 59.*
26. Peters, R. (2012) "Rural Entrepreneurship". *EU Rural Review. The Magazine from the European Network for Rural Development. No. 10.*
27. Phelan, C., & Sharpley, R. (2011). "Exploring entrepreneurial skills and competencies in farm tourism." *Lancaster: University of Lancashire.*

28. Reganold, J. (2016) "Organic profitability around the world." *United States Department of Agriculture.*

29. Rural Communities and Farming. *The Prince of Wales and the Duchess of Cornwall official website. http://www.princeofwales.gov.uk/*

30. Sulaiman, N., Abdullah, A. (2013). "Factors that influence the interest of youths in Agricultural Entrepreneurship". *International Journal of Business and Social Science Vol. 4 No. 3; pp 288-302.*
31. Tehrani, J. (2013) "Viewpoint: did our brains evolve to foolishly follow celebrities?" *BBC News.*
32. Tracy, J. L., & Robins, R. W. (2004). Putting the self into self-conscious emotions: A theoretical model. *Psychological Inquiry, Vol. 15, pp. 103–125*

33. Weber M, Eisenfuhr, F. and Winterfeldt, D. (1988). "The effects of splitting attributes on weights in multiattribute utility measurement". *Management Science. Vol. 34 No 4, pp. 431–445.*

APPENDIX I.

Experiment Questionnaire (English).

Part I.

You will be presented with 6 different spheres of entrepreneurship, which include Construction and Industrial goods, Consumer goods, Consumer services and health, Agribusiness, Finance and Technology. Imaging you are considering to become an entrepreneur. You are asked to rate the attractiveness of these 6 spheres for you as a potential entrepreneur on a 100 points scale, give "0" to the least attractive and "100" - to the most attractive. For example, if the most attractive sphere for you is X, then you give it "100" points. If X is for example two times more attractive than Y, then give Y "50" points. The short description of each sphere is presented under the Table.

Industry	**Attractiveness (from 0 to 100)**
Agribusiness	
Construction and Industrial goods	
Consumer goods	
Consumer services and health	
Finance	
Technologies	

Agribusiness. The sphere includes production of agricultural food, breeding, crops production and distribution, agrochemicals production. The sphere also includes agrotourism.

Construction and Industrial goods. This sphere includes Construction & Materials, Industrial transportation, engineering, electronic and electrical equipment and support services.

Consumer goods. This sphere includes automobiles and parts production, household goods (furnishing, durable goods), Fast Moving Consumers Goods, leisure goods (consumer electronics, toys, etc.), personal goods (clothing, footwear).

Consumer services and health. The sphere includes retail sales, media (broadcasting, publishing), travel and leisure, health-care services, equipment and pharmaceuticals.

Finance. The sphere includes insurance, real estate and financial services.

Technology. The sphere includes software and computer services, technology hardware and equipment.

Part II.

1. Evaluate the expected *Level of Income*, which you think each of the sphere of entrepreneurship can provide, give 100 points to one of the 6 spheres which provides the highest income and give 0 points to the sphere which provides the smallest income. Give all the other spheres from 0 to 100 points.

Industry	**Level of income (from 0 to 100)**
Agribusiness	
Construction and Industrial goods	
Consumer goods	
Consumer services and health	
Finance	
Technologies	

2. Evaluate on the same 100 points scale the *Level of Freedom*, which you think each of the sphere of entrepreneurship can provide.

Freedom means freedom in schedule, in choosing the market segment, in choosing the direction of your business, your strategy, in choosing the people to work with, freedom in changing, freedom in actions.

Industry	**Level of freedom (from 0 to 100)**
Agribusiness	
Construction and Industrial goods	
Consumer goods	
Consumer services and health	
Finance	
Technologies	

3. Evaluate the *Level of Esteem* by others, giving 100 points to the sphere which can provide the highest level of esteem for you as entrepreneur and 0 points to the sphere which provides the lowest Level of Esteem.

Esteem. Respect from your friends, schoolmates, relatives, colleague. Recognition and approval of your success.

Industry	**Esteem (from 0 to 100)**
Agribusiness	
Construction and Industrial goods	
Consumer goods	
Consumer services and health	
Finance	
Technologies	

4. Evaluate the level of *Self-realisation*, giving 100 points to the sphere which can provide the highest level of Self-realisation for you as entrepreneur.

Realisation. Self-realisation, an opportunity to do what you like, what you can, realisation of your potential/dream, happiness due to the creation of your own business. An opportunity to prove to yourself that "You can".

Industry	**Realisation (from 0 to 100)**
Agribusiness	
Construction and Industrial goods	
Consumer goods	
Consumer services and health	
Finance	
Technologies	

5. Evaluate the level of *Social preference* of each of the sphere.

Social preference. Usefulness of you and your business for the society/country/world. Your contribution to the economic growth of your country/region. Production of products or services which are sustainable and good for the environment.

Industry	**Social Preference (from 0 to 100)**
Agribusiness	
Construction and Industrial goods	
Consumer goods	
Consumer services and health	
Finance	
Technologies	

6. Evaluate the level of *Belonging* that each of the sphere of entrepreneurship can provide.

Belonging. Belonging to the business/ entrepreneurial society. Belonging to the community of people who contribute to the economical growth of the country.

Industry	**Belonging (from 0 to 100)**
Agribusiness	
Construction and Industrial goods	
Consumer goods	
Consumer services and health	
Finance	
Technologies	

7. Now you are asked to evaluate the importance of the criteria, described above: Level of Income, Level of Freedom, Level of Esteem, Self-realisation, Social preference and Belonging. Have a look at your previous answers, for each criterion you evaluated one sphere as "100" and another sphere as "0". You are asked to evaluate the importance of each "swing" from "0" to "100" on a 100 points scale, giving 100 points to the criterion, for which the improvement from the worst option to the best is the most significant for you and influences the most the attractiveness of the sphere of entrepreneurship.

Criterion	**Importance (from 0 to 100)**
Level of Income	
Level of Freedom	
Level of Esteem	
Self-realisation	
Social Preference	
Belonging	

Part III.

1. Gender: Male ___ Female ___

2. Age ___

3. In which city where you born? _____

4. Your parents education:

	Mother	Father
Primary		
Secondary		
University		

5.

a. Is any of your parents entrepreneur? Yes___ No___

b. Is any of your grandparents entrepreneur? Yes___ No___

c. If you answered "Yes" to question 4.a or 4.b write the sphere in which your parents are entrepreneurs_____

6. Rate your family income.

Poor☐ ☐ ☐ ☐ ☐ ☐ ☐ Rich

7. Are you considering entrepreneurship as your future career path? Yes___ No___

8. In which sector do you expect to work? _____

9. In which sector would you like to work?_____

10. If your answers to the questions 8 and 9 are different – explain why.

11. Do you consume organic food?

No__ Sometimes__ Mostly__

APPENDIX II.

Experiment Questionnaire (Spanish).

Parte I.

Se le presentarán 6 diferentes esferas de la actividad empresarial, que incluyen la Construcción y los Bienes Industriales, Bienes de Consumo, Servicios de Consumo y la Salud, Agronegocios, Finanzas y Tecnología. Imagine que usted está pensando en convertirse en un empresario. Se le pide que evalúe el atractivo de estas 6 esferas para usted como empresario potencial en una escala de 100 puntos, dando "0" a la menos atractiva y "100" a la más atractiva. Por ejemplo, si la esfera más atractiva para usted es la tecnología, entonces le da "100" puntos. Si la tecnología es, por ejemplo, dos veces más atractiva que la de Finanzas, a continuación, le da a Finanzas "50" puntos. La breve descripción de cada esfera se presenta en la Tabla.

Esfera	**Atracción (de 0 a 100)**
Construcción y bienes industriales	
Bienes de consumo	
Servicios de consumo y salud	
Agronegocios	
Finanzas	
Tecnologías	

Construcción y bienes industriales. Esta esfera incluye la construcción y materiales, transporte industrial, ingeniería, equipos electrónicos y eléctricos y servicios de apoyo.

Bienes de consumo. Esta esfera incluye automóviles y piezas de producción, artículos para el hogar (mobiliario, bienes duraderos), Bienes de Consumo de Alta Rotación, productos de ocio (electrónica de consumo, juguetes, etc.), artículos de uso personal (ropa, calzado).

Servicios de consumo y salud. La esfera incluye las ventas al por menor, los medios de comunicación (radiodifusión, publicación), viajes y ocio, servicios de atención a la salud, equipos y productos farmacéuticos.

Agronegocios. La esfera incluye la producción de alimentos agrícolas, la cría, la producción y distribución de los cultivos agrícolas, la producción de agroquímicos. La esfera también incluye el agroturismo.

Finanzas. La esfera incluye seguros, bienes inmuebles y servicios financieros.

Teconología. La esfera incluye software y servicios informáticos, hardware y equipos de tecnología.

Parte II.

Evaluar el *Nivel Esperado de Ingresos* que usted piensa que cada esfera de la actividad empresarial puede proporcionar, dando 100 puntos a aquella de las 6 esferas que proporciona mayores ingresos y 0 puntos a la esfera que ofrece la renta más pequeña. Dar a todas los demás valoraciones de 0 a 100 puntos.

Esfera	**Nivel de ingresos (de 0 a 100)**
Construcción y bienes industriales	
Bienes de consumo	
Servicios de consumo y salud	
Agronegocios	
Finanzas	
Tecnologías	

Evaluar en la misma escala de 100 puntos el *Nivel de Libertad* que usted piensa que cada esfera de la actividad empresarial puede proporcionar. Dará 100 puntos a la esfera que ofrece el más alto nivel de libertad y 0 puntos a la esfera que ofrece el más bajo nivel de libertad.

Libertad significa libertad en el horario, en la elección del segmento de mercado, en la elección de la dirección de su negocio, su estrategia, en la elección de las personas para trabajar con libertad en el cambio, la libertad en las acciones.

Esfera	**Nivel de Libertad (de 0 a 100)**
Construcción y bienes industriales	
Bienes de consumo	
Servicios de consumo y salud	
Agronegocios	
Finanzas	
Tecnologías	

Evaluar el *Nivel de Estima* de los demás, dando 100 puntos a la esfera que puede proporcionar el más alto nivel de estima para usted como empresario y 0 puntos a la esfera que ofrece el más bajo nivel de estima.

Estima. El respeto de sus amigos, compañeros de clase, familiares, colegas. El reconocimiento y la aprobación de su éxito.

Esfera	**Nivel de Estima (de 0 a 100)**
Construcción y bienes industriales	
Bienes de consumo	
Servicios de consumo y salud	
Agronegocios	
Finanzas	
Tecnologías	

Evaluar el Nivel de *Auto-realización*, dando 100 puntos a la esfera que puede proporcionar el más alto nivel de auto-realización para usted como empresario y 0 puntos a la esfera que ofrece el más bajo nivel de autorrealización.

Realización. La auto-realización, la oportunidad de hacer lo que le gusta, lo que puede, realización de su potencial / sueño, felicidad, debido a la creación de su propio negocio. Una oportunidad para demostrar a sí mismo que "Puede".

Esfera	Nivel de Auto-realización (de 0 a 100)
Construcción y bienes industriales	
Bienes de consumo	
Servicios de consumo y salud	
Agronegocios	
Finanzas	
Tecnologías	

Evaluar el nivel de *Preferencia Social* de cada una de la esfera.

Preferencia social. Utilidad de usted y su negocio para la sociedad / país / mundo. Su contribución al crecimiento económico de su país / región. La producción de los productos o servicios que sean sostenibles y buenos para el medio ambiente.

Esfera	Nivel de Preferencia Social (de 0 a 100)
Construcción y bienes industriales	
Bienes de consumo	
Servicios de consumo y salud	
Agronegocios	
Finanzas	
Tecnologías	

Evaluar el nivel de *Pertenencia* que cada una de las esferas de la actividad empresarial puede proporcionar.

La Pertenencia. Perteneciente a la comunidad empresarial / emprendedora. La pertenencia a la comunidad de personas que contribuyen al crecimiento económico del país.

Esfera	Nivel de Pertenencia (de 0 a 100)
Construcción y bienes industriales	
Bienes de consumo	
Servicios de consumo y salud	
Agronegocios	
Finanzas	
Tecnologías	

Ahora se le pide que evalúe la importancia de los criterios descritos anteriormente: nivel de ingresos, nivel de libertad, nivel de estima, auto-realización, preferencia social y pertenencia. Eche un vistazo a sus respuestas anteriores, para cada criterio usted ha valorado una esfera con un "100" y otra con un "0". Se le pide que evalúe la importancia de cada cambio de "0" a "100" en una escala de 100 puntos, dando 100 puntos al criterio para el que la mejora desde la peor opción a la mejor es la más significativa para usted e influye más el atractivo de la esfera de la actividad empresarial.

Criterio	**Importancia (de 0 a 100)**
Nivel de Ingresos	
Grado de Libertad	
Nivel de Estima	
Auto-realización	
Preferencia Social	
Perteneciente	

Parte III.

1. Sexo: Hombre ___ Mujer ___

2. ¿Cuántos años tiene? _____ años.

3. ¿En qué ciudad nació? _____

4. Formación de los padres:

	Madre	Padre
Estudios primarios		
Estudios secundarios		
Estudios universitarios		

5.

a. ¿Alguno de sus padres es empresario? Sí___ No___

b. ¿Alguno de sus abuelos es empresario? Sí ___ No___

c. Si su respuesta es "Sí" a la pregunta 5.a o 5.b escribir el ámbito en el que sus padres son empresarios _____

6. ¿Cómo clasificaría la renta de su familia hace 10 años? Por favor, ponga una X en esta escala.

Muy Pobre ☐ ☐ ☐ ☐ ☐ ☐ ☐ Muy Rica

7. ¿Está considerando la actividad empresarial como su futuro profesional? Sí ___ No_ __

8. ¿En qué sector espera trabajar?_____

9. ¿En qué sector le gustaría trabajar?_____

10. Si sus respuestas a las preguntas 8 y 9 son diferentes - explicar por qué.

11. ¿Usted consume alimentos ecológicos? No__ A veces__ A menudo__

APPENDIX V.

Three Variables Model Outliers.

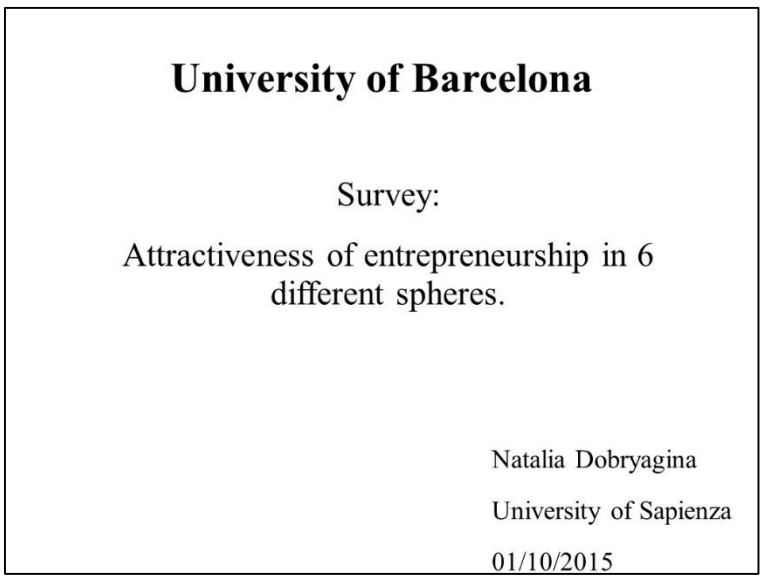
Three Variables Regression Model (Treatment Group) Unusual Observations ands Outliers.

Obs	AttAgriad	Fit	Resid	Std Resid		
5	0,00	58,68	-58,68	-2,09	R	
13	70,00	68,90	1,10	0,04		X
34	0,00	69,29	-69,29	-2,45	R	
39	90,00	72,56	17,44	0,65		X
56	100,00	32,81	67,19	2,39	R	
105	0,00	58,86	-58,86	-2,10	R	
111	100,00	38,74	61,26	2,17	R	

APPENDIX VI.

Presentation in Control Group (English).

In order to optimise the Information in Appendixes, the presentation for the Control Group is presented in English version. The Treatment Group Difference is in slides which describe the Agricultural sphere. The Treatment Group slides on Agriculture are presented in the next Appendix in Spanish.



Construction and Industrial goods

The sphere includes

Construction & Materials,

Industrial transportation,

Engineering,

electronic & electrical equipment.

Ogilvie Construction

Donald McDonald

Managing Director

ASHE Group

Robert Blake
Chairman

Consumer goods

Automobiles & parts production,

Household goods (furnishing, durable goods),

Fast Moving Consumers Goods,

Leisure goods (consumer electronics, toys, etc.),

Personal goods (clothing, footwear).

Unicharm
Takahisa Takahara
President & CEO
(baby and chidcare products, health and cosmetics)

Grupo Bimbo
Daniel Servitje
Chairman of the Board and CEO
(FMCG)

Consumer services and health

Retail sales,

media (broadcasting, publishing),

Travel & leisure,

health-care services, equipment and pharmaceuticals.

The Home Depot
Matt Carey, Executive Vice President & Chief Information Officer
(home improvement specialty retailer)

Metro Group
Olaf Koch
Chairman of the Management Board
(FMCG, retail)

Finance

Insurance

Real Estate

Financial services.

Elephant.com
Kevin Chidwick,
Chief Executive
Officer.
(insurance)

Fortune International
Group
Edgardo Defortuna
President and CEO
(real estate)

Technology

Software & computer services

Technology hardware & equipment.

Giraffic
Jeffrey Parkinson,
Board Member.
(Adaptive Video Acceleration)

Neopost
Denis Thiery,
CEO
(Digital communications)

Agriculture

Production and distribution of agricultural food and crops. Agrochemicals production and breeding. Agrotourism.

Agrochemicals production and breeding. Agrotourism.

Lakeland Dairies
Aloysius Duffy
Chairman

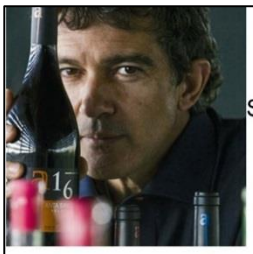
Aurivo
Aaron Forde
Chief Executive

APPENDIX VII.

Treatment Group Agricultural Sphere Presentation (Spanish).

José Antonio Iniesta

productos agrícolas orgánicos
productor.



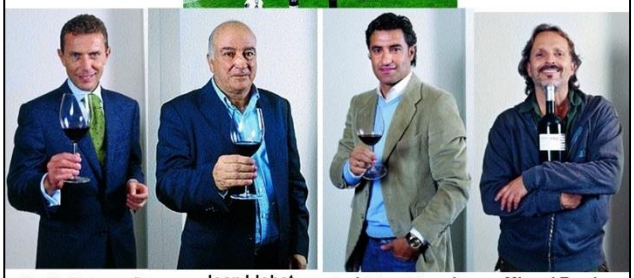
Antonio Banderas

Se convirtió en copropietario de un Anta Bodegas

que los productores de vino Ribera del Duero y el aceite de oliva virgen.

Casalobos

un tinto Manchego productores



Emilio Butragueño | Joan Llobet | José Miguel González | Miguel Bosé

PART IV. Interviews With Entrepreneurs From Agricultural and Urban Spheres.

1. INTRODUCTION.

The Dissertation is focused on Promotion of Entrepreneurship in the sphere of Agriculture. According to the conclusions of the Parts I, II and III, non-financial methods of Agricultural entrepreneurship promotion are underused; also the existing approaches are mostly focused on hereditary entrepreneurs, while the non-hereditary entrepreneurs often bring new technologies, business education, capital and networks into the sphere. The Part III of the Thesis consisted of experiment, devoted to non-pecuniary method of Agricultural entrepreneurship promotion. The experiment was conducted on potential entrepreneurs, business students of the University of Barcelona. The potential future entrepreneurs' perception of the Agricultural sphere, its opportunities and benefits were at the focus of the experiment. The priorities, value system and common biases of potential future entrepreneurs is an important direction of research, which might provide strong contribution to the development of Agricultural entrepreneurship promotion methods. However, Paper I and II of the Thesis have opened another direction of research, which would be focused on already working non-hereditary entrepreneurs in Agriculture. As it was shown in Paper I, the majority of existing research was devoted to hereditary entrepreneurs in the sphere of Agriculture.

The Paper IV presents a survey, which consists of interviews with existing non-hereditary entrepreneurs in Agriculture (Rural Group) and entrepreneurs from five other business spheres, which can be assigned to the Urban Group of entrepreneurs.

It's logical to assume that individuals, who become non-hereditary entrepreneurs in the sphere of Agriculture might have certain similarities in terms of value system, priorities, preferences and behavior. Applying Paper II terminology, the potential entrepreneurs in Agriculture perception of entrepreneurial decision criteria importance might be different from Urban entrepreneurs perception: $w_{e,j} \neq w_{f,j} \quad \forall e \neq f$.

Paper II classification of entrepreneurship determinants can be also applied in a research on entrepreneurs in the sphere of Agriculture and other spheres. Paper III experiment applied the MCDA model of alternative Attractiveness evaluation, which can be presented as $V_a = \sum_{j \epsilon J} w_j \, v_{a,j}$. The approach assumes that the Decision Maker compares several alternatives.

Experiment or interview with existing entrepreneurs in a certain sphere doesn't allow application of the MCDA approach as the entrepreneurial decision was already made in favor of one of the business spheres. Only the direct importance judgement procedure can be applied in case of the existing entrepreneurs. In other words, the interviewees can only be asked to evaluate the absolute importance of a certain criterion on a 100 points scale.

Part IV represents a survey, conducted on entrepreneurs from six different spheres (the survey applied the same list of business spheres as the Part III): Agriculture, Constructions, Consumer Goods, Consumer Services and Health, Finance and Technology. The goal of the survey was to gain data on the absolute importance of six criteria, developed in Part II of the Thesis, and to gain additional information on Decision Making process of entrepreneurs through open questions. Interviewing was chosen as a survey methodology due to opportunity of follow-up questions. As the focus of the survey is the non-hereditary entrepreneurs in Agriculture, Russia was chosen as a country for interviews conduction as, due to historical reasons, the country has a much higher percentage of non-hereditary entrepreneurs in Agriculture, than the Western European countries. Also the promotion of entrepreneurship in Agriculture was declared as one of the key goals of 2020 country development program.

30 non-hereditary entrepreneurs from Agricultural sphere and 30 entrepreneurs from Urban business spheres were recruited for the survey. Due to high diversity of business spheres among Urban entrepreneurs and limited amount of the survey participants (60 in total), I consider the interviews as a pilot research, devoted to the analysis of differences in entrepreneurial determinants importance among Rural and Urban entrepreneurs.

The goal of the research is to compare the importance of pecuniary and non-pecuniary criteria for Rural and Urban entrepreneurs, analyse the entrepreneurs' level of dedication to their business sphere and to gain additional information on non-hereditary Agricultural entrepreneurs behavior.

2. METHODOLOGY.

Rural vs Urban Entrepreneurs.

The Part III of the Thesis presented the experiment participants six business spheres, which included Agricultural sphere. The Interview in Part IV would divide the entrepreneurs into two groups: the entrepreneurs in the Agricultural sphere (Rural) and Urban entrepreneurs. The urban entrepreneurs will be presented by business people from the spheres of Constructions, Consumer Goods, Consumer Services and Health, Finance and Technology. On the one hand, the five urban business spheres demonstrate diversified group, however, a number of existing researches contrasts the urban and rural entrepreneurs (Nielsen and Freire-Gibb (2010), Faggio and Silva (2014)). In Stathopoulou, Psaltopoulos, and Skuras paper (2004) on entrepreneurship in Switzerland cognitive requirements and organizational behaviour of rural entrepreneurs were proven to be different from those in urban areas. The two groups approach gives an opportunity to compare entrepreneurs from the sphere of Agriculture to entrepreneurs from five other sphere. Applying the results of the existing research, I assume that entrepreneurs in Agriculture, in contrast to urban entrepreneurs, form a group with statistically significant difference in criteria importance and entrepreneurial decision strategies.

Country Choice for Interviews Conduction.

The important issue of the research is recruitment of non-hereditary entrepreneurs in the sphere of Agriculture to participate in the survey. Broadly speaking, the research on entrepreneurship in Agriculture is limited due to two main issues. Firstly, because many entrepreneurs receive farms and business from their parents. Secondly, because farmers receive high level of support in a form of subsidies from the government, so they are eliminated from the market processes what excludes them from research on entrepreneurs behaviour (Alsos, 2011). In Russia after the collapse of the Soviet Union, these two factors were eliminated due to historical reasons. After the revolution, the lands which were owned by Russian aristocrats and business people were confiscated. During 70 years of USSR, all agricultural lands were the property of collective ownership (“kolhoz” and “sovhoz”), entrepreneurship as well as other types of business didn’t exist. The whole economy was organised according to the principles of central governmental planning. In 1991, the USSR collapsed and most of the kolxozs and sovhozs were destroyed. Total economic collapse caused a 53% decrease in agricultural production in Russia during the period from 1992 to 1995 as well as the total employment in agriculture decrease from 72.1 to 67.1 million people (According to the official source “Russia in numbers. Finance and Statistics”, 1996). The mass bankruptcy of companies and kolhozs

after the collapse of the Soviet Union was another factor, which had a negative influence on the economic performance of the country (Eliseeva, 2010). Part of the lands were privatised according to the law of "Privatisation of the governmental and municipal enterprises" from 1991. Privatised land is often kept by owners as investments and resold to people who decide to invest in Agricultural business (Ananian, 2013). Due to the historical reasons mentioned, the percentage of non-hereditary entrepreneurs in the sphere of Agriculture is much higher in Russia than in Western European countries.

Agricultural business in Russia still receives very limited subsidies from the government, which are limited to co-financing of the costs connected with the registration of ownership and other costs related to the governmental registration or certificates acquisition (The Ministry of Agriculture of the Russian Federation website, 2015).

Due to the reasons mentioned above, the two issues, which limit the opportunities of the research (inheritance and subsidies), are eliminated. The Russian Federation, as a post-soviet country with limited subsidising of agricultural entrepreneurship, was chosen as an optimal place of interviews conduction.

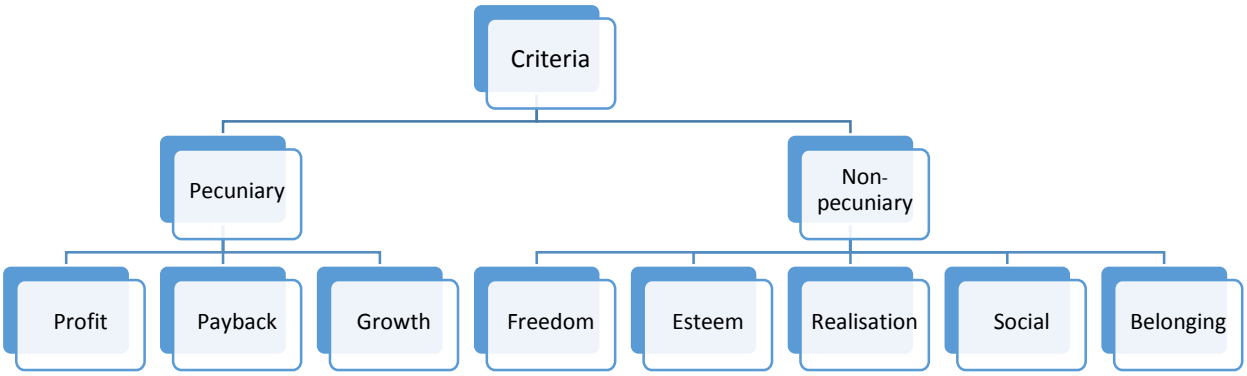
Interview Design.

The goal of the interview is to identify the difference in decision criteria importance of Rural and Urban entrepreneurs. The MCDA approach which evaluates the weight of criteria, applying swing weighting procedure, is not applicable in case of existing entrepreneurs, which already made an entrepreneurial decision. As a result, the interviewees can assess only the absolute importance of criteria. Being presented with a list of criteria, they can assign 100 points to the most important criterion and assign all the other criteria scores from 0 to 100, taking into account that 100 points is the importance of the most significant criterion and 0 can be assigned only to a criterion which doesn't have any value for the interviewee. As the list of criteria represent one pecuniary criterion Income and five non-pecuniary criteria and interviewee is asked to evaluate the absolute importance of criteria, the interviewee's responses might be biased. Firstly, because asking the interviewees for direct importance judgement is an approach with strong limitations. Experimental research proves that this approach "doesn't "behave like" swing and tradeoff weights" (Morton, 2011). Another complication in the criteria weighting is the structure of the criteria. The criteria, presented to the interviewee has a clear structure, which divides the attributes to the financial criterion Income and other five non-financial criteria. According to the existing literature on Multi-Criteria Decision Analysis, if a criterion is divided into components, the aggregate weight can be increased (Weber 1988). In other words, the importance score assigned to the criterion Income can be underestimated by the interview

participants. In order to avoid the described bias, I've conducted three trial interviews with entrepreneurs. I've also divided the pecuniary criterion to three factors, described in Paper II (Profit, Payback period and Growth).

In the trial survey the interviewees were presented with a full list of pecuniary and non-pecuniary criteria, developed in Part II of the Dissertation, presented is Scheme 1.

Scheme 1. List of Entrepreneurial Decision Criteria.



They were asked to evaluate the importance of all criteria on a 100 points scale, giving 100 points to the most important criterion and evaluating the importance of other criteria from 0 (not important) to 100. A consistency check was performed after the trial: the scores; assigned by the participants; were accumulated into two groups: financial and non-financial, the interviewee was presented with the aggregate scores of the two groups and asked whether he/she agrees with the scores. The results of the three trial interviews are presented in Table 1.

Table 1. Trial Interviews Results.

N	Income	Freedom	Esteem	Realisation	Social	Belonging	Cum.weight
1	100	50	15	60	20	0	145
2	100	50	20	20	20	20	130
3	100	60	10	70	0	10	150

The pecuniary factors are presented by only one criterion Income, because all three interviewees expressed difficulties in evaluating the three pecuniary criteria separately. When the interviewees were presented with a cumulative weight of non-pecuniary criteria and asked to compare it to the weight of the criterion Income, all three interviewees didn't agree with the result and declared that the financial criterion has higher importance than the group of non-financial criteria.

After the trial interviews, I've decided to divide the interview into three stages.

On the *First Stage,* interviewee is asked to assess the importance of two groups of factors for him/her as an entrepreneur: Pecuniary and Non-pecuniary.

Interviewee is asked to choose the more important group of factors and rank it as 100, then to rank the second group of factors assigning it a score from 0 to 100. For example, if the group of criteria, which received the score of 100, is two times more important, than the second group, then the group two should be assigned 50 points.

Table 2. Stage One of the Interview.

Group of criteria	**Importance**
Pecuniary	
Non-pecuniary	

On the *Second Stage*, each interviewee is presented with a list of five non-financial attributes: Realisation, Freedom, Esteem, Social Preference and Belonging. He/she is provided with explanation of the meaning of each of the criteria. The interviewee is asked to give 100 points to the most important factor for him/her as an entrepreneur. Then interviewee is asked to assess the importance of each criterion, ranking it from 0 to 100. The interviewee can assign 0 points to the criterion, which doesn't have any value for him/her as entrepreneur.

Table 3. Stage Two of the Interview.

Attribute	**Importance**
Realisation	
Freedom	
Esteem	
Social Preference	
Belonging	

The two stages approach has several advantages. Firstly, it has a debiasing effect. As we've seen from the trial survey results, interviewees don't agree with the final score of the non-pecuniary group of factors. As the financial group is presented by one factor Income and non-financial is presented by five factors, interviewees' direct importance judgement are biased due to the value tree structure. The two stages assessment helps in avoiding this bias.

Secondly, as it was identified in the Part I survey, interviewees might understate the

importance of the criterion Esteem as they might avoid admitting that they are looking for approval and recognition. The two stages procedure eliminates this shortcoming as in the first stage individual evaluates the importance of the whole group of non-financial criteria in contrast to pecuniary criterion Income.

After feeling in the questionnaire, interviewee is asked to imagine that he/she has an opportunity to change his/her business sphere to another one, in which he would have the same level of knowledge, experience, networks and resources, but the profits would be 10% higher guaranteed. The interviewee is asked whether he would agree to change his/her business sphere, if he doesn't he is offered 20%, then 30% and so on, till it reaches 100%. This question is expected to identify how devoted is the interviewee to his/her business sphere.

During the interviews the participants are asked follow-up questions, they are asked to explain in their own words reasons of being entrepreneurs, to explain the scores which they assign to the factors and if the interviewee refuses to change his business sphere even if the profits grows to more than 100%, he is asked to explain why.

Interview Subjects.

Interviews were conducted in Russia with 60 entrepreneurs, out of which 30 were non-hereditary entrepreneurs from the sphere of Agriculture and other 30 from the spheres of Constructions, Consumer Goods, Consumer Services and Health, Finance and Technology.

The age of entrepreneurs ranged from 28 to 54, the background, education and city of origin also varied. Three interviewees in Agro Group (10%) and seven interviewees in Urban (16,6%) have business education.

The interview participants in Agriculture were recruited on the Farmer's Exhibition "Agrorus 2015", through the farmers' products distribution organization "LavkaLavka" and through the farmers product markets in Saint-Petersburg: "Torgkovskiy", "Sennoy" and "Sitniy".

The interview participants from other spheres were recruited through the Graduate School of Management of the Saint-Petersburg State University alumni society, the "Russian Union of Industrialists and Entrepreneurs" organization and "Saint-Petersburg Union of Entrepreneurs" organisation.

Research Limitations.

Due to limited number of interviewees, the great diversity in interviewees' backgrounds, spheres of specialisation, education and level of income, the research has certain limitations.

A number of influencing factors were identified in the research: the results of the interviews depended on the level of income, on the current success of the business, on the place/source of the interview participants recruitment and on the age and gender of participants. However, due to limited number of interviewees, the dependence of the interview results on the described factors could not be statistically proven. Due to what this pilot survey provides a number of suggestions for further research.

Another research limitation was the absence of financial compensation for the interview participants, what could provoke biased answers to the survey questions.

3. RESULTS.

The survey results represent data on two groups of interviewees: Rural and Urban entrepreneurs. The average importance of criteria, evaluated in two stages, is presented in Table 4.

Table 4. Average Importance of Criteria for Rural and Urban Entrepreneurs.

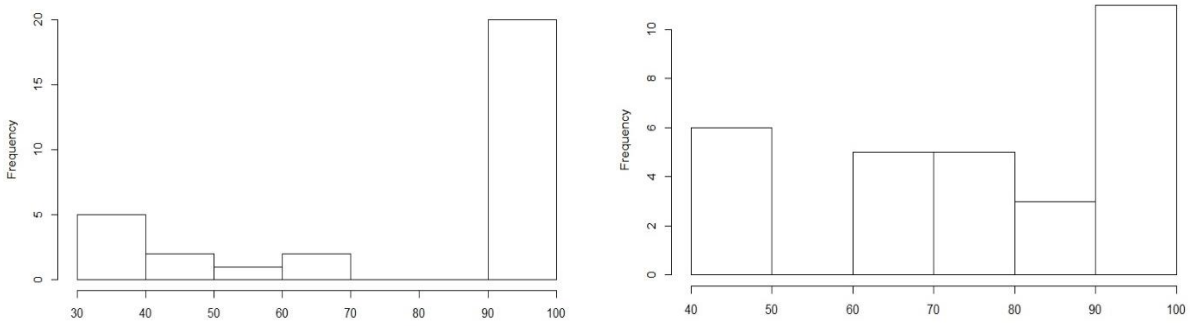
	Fin	Nonfin	Freedom	Esteem	Real.	Social	Belong
Rural	77	82,33	82	63	77,93	60,17	35
Urban	91,33	81	68,27	62,67	89,6	31,33	28,67
Diff	-14,33	1,33	13,73	0,33	-11,67	28,83	6,33

Firstly, the interviewees evaluated the importance of Financial and Non-financial groups of factors. As we can see from the table, the difference in mean values of the financial criterion importance in Rural (77,24) and Urban Group (91,33) is statistically significant (the t-test p-value = 0.01445). However, the average importance of the Non-financial group of criteria is nearly the same (81,72 in Rural and 81 in Urban Groups). The Survey shows that the pecuniary factors on average play less significant role for the non-hereditary Agricultural entrepreneurs, than for the entrepreneurs from other business spheres. This observation demand further research with bigger samples and points out the importance of non-pecuniary approaches to entrepreneurship in Agriculture promotion. The insignificant difference between the non-financial criteria importance can be explained by the great diversity among survey participants,

what can be seen from the distribution of results, presented in Histogram 1.

Histogram 1. Distribution of Non-financial Criteria Importance Scores

Rural Group *Urban Group*



In Rural Group the percentage of people who gave non-financial criteria 100 points of importance is 66,7%, while in Urban Group 37%, however the average score is nearly the same because in the Rural Group 16,7% of interviewees assigned the Non-financial criteria score lower than 50, while in Urban Group the percentage of such interviewees is significantly lower, 6,7%. The interesting observation, which can be made, is that four out of five interviewees in Rural Group who gave non-financial criteria lower than 50 score were interviewees recruited on the "Agrorus" farmers products exhibition. The interviewees were asked, why they gave such a low score to the non-financial factors. In the open question discussion, the participants complained about an unexpectedly high increase in the rent prices of the 2015 exhibition and decreased profits as a consequence. Also out of four interviewees only one entrepreneur said that he would agree to change his sphere of business if the income increases by 50%. The other three refused to change the Agricultural sphere of business even if the income would increase by more than 100%. The conclusion, which can be made from the follow-up discussion, is that the low score, assigned to the non-pecuniary factors could be biased. Firstly, the interviewees were influenced by the negative emotions due to higher rental costs, secondly, the fact that three out of four interviewees refused to change the business sphere even if the profit increases by 100% proves that the non-financial factors play more significant role in their decision making process and business sphere choice.

The five factors in non-pecuniary group will be considered in rural and urban groups data, without taking into account Stage one results, in other words the scores assigned to the five factors won't be multiplied by the non-pecuniary group of factors score. Due to the fact that the survey applies direct importance judgement and the biases in evaluation of criteria importance were already identified on the stage one of the interview, I'll consider only the values assigned

to five criteria on the second stage of the interview separately.

Considering the average importance of non-pecuniary factors in two groups, we can see that the importance of Freedom and Social Preference is significantly higher (by 13,73 and 28,83 points respectively) in the Rural Group. The difference in scores is undoubtedly statistically significant (t-test p-values 0.0008173 and 0.02366 respectively). At the same time the importance of criterion Realisation is on average by 11,67 points higher among Urban entrepreneurs, however the t-test p-value is 0,0989. As we are applying a typical significance level of $\alpha = 0{,}05$ and p-value of the Welch t-test is greater than the significance level, we fail to reject H_0 and we conclude that the difference in the Realisation importance is not statistically significant.

The Part II model is applicable in survey results: $w_{e,j} \neq w_{f,j} \ \forall e \neq f$, where $w_{e,j}$ is the importance of criterion *j* for the decision maker *e*. From the results of the survey, we can conclude that the importance of pecuniary determinants is lower for entrepreneurs in Agriculture, what can be modeled as $w_{r,p} < w_{u,p}$, which means that the importance *w* of pecuniary factors *p* for the rural entrepreneurs *r* is lower than for the urban entrepreneurs *u*. From the data on average importance of criteria, we can also conclude that, compared to entrepreneurs from other spheres, entrepreneurs in Agriculture give Freedom and Social Preference higher importance as their entrepreneurial career determinants: $w_{r,f} > w_{u,f}$ and $w_{r,s} > w_{u,s}$, where *f* stands for Freedom and *s* stands for Social Preference. The survey results show that entrepreneurs in Agriculture are significantly more focused on Social preferences and Freedom than entrepreneurs from other spheres.

According to the survey result, the non-hereditary entrepreneurs in the sphere of Agriculture should be motivated not only by pecuniary but also by non-pecuniary approaches. The informing approach, which was applied in the experiment in Part III opens a new direction of research on possible use of celebrities advertisement as well as informing entrepreneurs on the existing opportunities in the Agricultural sphere, profit directions of business development, cooperation with retailors and others. As Freedom as a criterion received the highest average score of importance in Rural entrepreneurs group, it demands attentive consideration in terms of the potential approaches of Agricultural entrepreneurship promotion. Freedom implies freedom in schedule, in choosing the business development direction, etc. Further research can be conducted on which aspects of Freedom attract attention of the potential Agricultural entrepreneurs, if the freedom in choosing business development direction plays a significant role, then informing entrepreneurs about the great variety of opportunities and business directions in Agriculture might be an effective motivating instrument.

As it was previously mentioned, each interviewee was asked whether he/she would agree to change his/her business sphere if the profits would be higher by a certain percent guaranteed. The percentage income increase, on which interviewees agreed to change the business sphere, which would be called the Switching factor, was presented as a variable from 10 to 100. If the interviewee refused to change his/her business sphere even if the profit increase would be greater than 100%, the answer was marked as 100+. In the average scores calculation as well as in correlation analysis the 100+ score was calculated as 100. As a result the mean Switching factor was 89,3 in Rural Group and 49,5 in Urban.

The number of 100+ answers was 14 (46,7%) in Rural Group and 1 (3,3%) in Urban Group. In Rural Group nine interviewees declared 100% income increase as a switching point, one said that 80% income growth would make him switch to another business sphere, five agreed to change the industry if the income would be 50% higher guaranteed. In the Urban Group four interviewees claimed to be ready to change the industry if the income increases at least by 10% (all four interviewees mentioned current difficulties in business), three others named 20% Income increase as a Switching point, 30% was a sufficient increase for three interviewees, two mentioned 40%, seven stopped at 50%, one interviewee stopped at 70%, one said that if the income would increase at least by ¾ (what was interpreted as 75% increase), he would agree to sell his business and start a new one in another industry, four interviewees agreed to switch to another business sphere if the income would be two times higher (by 100%) guaranteed.

The results prove that entrepreneurs in Agriculture are significantly more devoted to their business sphere, than entrepreneurs from other spheres. This is an important conclusion of the survey, as it points attention to the entrepreneurial decision switching costs. It also attracts attention to the fact that entrepreneurs from urban spheres can be attracted to the Agricultural sphere as they are less attached to their sphere of business. Another conclusion, which can be made, is that the non-pecuniary determinants of entrepreneurship play crucial role for entrepreneurs in Agriculture as 46,7% level of refusals to change the business sphere even if the income is 100% higher, signals that non-pecuniary factors play more significant role in entrepreneur's choice of business sphere.

The open questions also revealed that entrepreneurs in Agriculture apply Satisficing rule (described in Paper II) to the criterion Income. When interviewees were asked to evaluate the importance of the pecuniary criterion, eight entrepreneurs commented that they would like to achieve a certain satisfying level of Income and if the level is achieved, then the non-pecuniary criteria would play more significant role. The comments included:

"For me it's crucial to achieve the level of Income high enough so that my wife would be able to leave her job";

"First I need to achieve the desired level of profit, then I would concentrate more on self-realisation";

"*Interviewee*: Income is the most important factor. The most important for me is to be able to earn enough.

Interviewer: And if you achieve the satisfying level of income, would you concentrate on earning and devote more time to business or would you focus on other issues like work-life balance and self-realisation?

Interviewee: I would focus on work-life balance, I won't sacrifice more time for greater profit."

As it can be seen, the evaluation of attributes importance could be biased because of the absence of alternatives and application of direct importance judgement procedure: if the swing weighting procedure was used, the interviewees would evaluate the importance of the difference between alternatives performance on criteria. In case of direct importance judgement procedure it's difficult to separate the maximisation and satisfying approaches to criteria, however, as the interview procedure allows follow-up questions and discussion, the application of satisficing rule among rural entrepreneurs was revealed.

Another source of information in the Survey results data is the correlation between the importance scores assigned to criteria. I'll consider the cases, when the correlation coefficient is equal or greater than 0,3 (medium to large strength of association).

In Urban Group there is a significant negative correlation (-0,31) between importance of Financial factors and importance of Social Preference. In other words, the entrepreneurs, giving higher importance to financial benefits of the business give lower importance to the social, altruistic and sustainable values. The interesting observation is that in Rural Group there is no significant correlation (-0,08 correlation coefficient) between these factors importance.

The negative 0,7 correlation between the importance of Financial factor and Switching factor again proves that the higher importance of Financial factors would decrease the minimum income growth needed for changing the business sphere. Higher importance of pecuniary criteria is associated with lower dedication of entrepreneur to his/her business sphere or industry.

Another interesting correlation in Urban Group is 0,566 correlation between Social Preference importance and Switching factor. The possible explanation is that the more entrepreneur cares about society, environment and sustainability principles the higher should be the Income increase to make him/her change his/her business sphere to another one which

might provide less altruistic and sustainable results. It's also possible to assume that high importance of helping the society and environment limits the possible business spheres, in which interviewee might work.

In Rural Group we can track a significant negative correlation (-0,44) between importance of Financial factors and Switching factor, what confirms the similar results in the Urban Group.

In contrast to the Urban Group, in Rural Group we can observe a significant correlation between Esteem and Realisation (0,595) and Esteem and Belonging (0,537). A possible explanation might be that the Self-realisation for the entrepreneurs in the sphere of Agriculture is more connected with society: society approval or being useful for the society (the idea is supported by the correlation between Realisation and Social preference (0,22) as well as by high importance of Social preference criterion) represents important aspect of Agricultural entrepreneur's Self-realisation.

The previous Papers has shown that context and territorial context specifically might play a significant role for rural entrepreneurs, due to what the rural entrepreneurs were also divided into subgroups according to their geographical provenance. If we apply the differentiation of territorial context into lowland and highland (mountainous areas), we'll see that all the interviewees were from the lowland. Due to the size of the country and amount of fertile land, the amount of agricultural business in mountainous areas is limited and mostly concentrated in Caucasus region (in such regions as Kabardino-Balkaria, Dagestan, Chechnya, Adygea, Ingushetia and Karachaevo-Cherkessia). None of the interviewees represented the mentioned Caucasus regions.

Another approach, which can be applied to diversify the interview participants, assumes differentiation of interviewees according to their geographical provenance. According to the OECD classification the areas is urban if the population of the area has at least 50 000 inhabitants and rural otherwise (OECD, 2012). I won't divide the interviewees further to peri-urban and other subgroups because the population density as well as population size of peri-urban area is not determined in existing literature (Laquinta & Drescher). As a result, 30 out of 30 interviewees in Urban group have urban provenance (they were born in areas with population equal or greater than 50 000), in Rural group 19 interviewees have urban provenance and 11 have rural provenance. If we consider separately these two subgroups in Rural group, we'll receive the following results: the average importance of financial factors for urban subgroup is 82,6 while for the rural subgroup it's 67. The average importance of non-financial factors is 85 and 76 for the urban and rural subgroups respectively. The average switching factor is 91 and 85 for urban and rural subgroups respectively. According to the results the urban subgroup of rural entrepreneurs shows higher average scores for both financial and nonfinancial factors, the

average switching factor is also higher for the urban subgroups. As the Part III of the Thesis has demonstrated, interviewees from smaller cities on average give lower score to the financial factors, in contrast to participants from Barcelona; the higher average score of financial factor for urban provenance group in Part IV might be due to the fact that interviewees, who were born in rural areas of Russia give less importance to the non-financial factors, in contrast to people with urban provenance, however due to very limited number of people in the rural subgroup further research is needed. The lower average score of non-financial factors, assigned by the subgroup with rural origins might demonstrate a biased result due to the fact that three interviewees in this group gave very low score of attractiveness (30 points) to the non-financial group (however, as it was mentioned previously, these interviewees assigned the score applying the satisfying rule to the non-financial factor and were biased due to the unexpectedly high increase in the rent prices of the 2015 Agrorus exhibition).

As it was already mentioned, due to the limited number of subgroups participants further research is needed for investigation of the impact of the geographical provenance of entrepreneurs on their perception of financial and nonfinancial factors importance.

4. RELEVANCE AND APPLICABILITY.

The promotion of Agricultural entrepreneurship is a part of the 2020 country's development plan in Russia (according to the official "Concept of Long-term Socio-economic Development of The Russian Federation for the Period till 2020", published on the website of the Government of the Russian Federation), what makes the Survey results relevant for the country, in which the interviews were conducted. The survey is considered as pilot due to limited number of participants, their backgrounds and business spheres variety and absence of the financial compensation for the participation in the interview. As a consequence, one of the goals of the survey is to open new directions of research in the sphere of Agricultural entrepreneurship promotion. The survey suggests several new routes of research. Firstly, the high importance of Freedom and Social preference for entrepreneurs in Agriculture demands more detailed consideration of these attributes and opportunities for their utilisation in development of Agricultural entrepreneurship promotion methods. The survey result leads to an assumption that more entrepreneurs can be attracted to the Agriculture through such benefits of the sphere as Freedom and Sustainability: bio and organic food production, for example, might be a motivating reason of entering the sphere, as organic food production is often considered as

sustainable and socially responsible activity (Strassner, 2015). The importance of criterion Freedom demands further research on the constituents of the criterion: whether entrepreneurs are more attracted by the freedom in schedule and work-life balance, the freedom from the work in the office, or the freedom in choosing business development direction is taken into account. The methods of Agricultural entrepreneurship promotion might be based on the results of further surveys and experiments, which would determine which aspects of Freedom influence potential future entrepreneurs.

The significant correlation between Realisation and Esteem importance for entrepreneurs in Agriculture assumes a considerable social component in entrepreneurs' perception of self-realisation. In other words, the survey shows greater importance of acceptance and recognition for the rural entrepreneurs realisation, what stresses the importance of those agro-entrepreneurship promotion methods, which focus on recognition, status, prestige and feeling of belonging. Consequently, the approach of Agricultural entrepreneurship promotion, modeled in Part III experiment, which includes involvement of celebrities, involved in agro-production, receives additional support from the Part IV survey results.

The dedication of rural entrepreneurs to the Agricultural sphere of business is an important aspect of entrepreneurs' behavior, what might help in retention of entrepreneurs in the sphere. On the other hand, the satisfying approach to pecuniary factors might cause limited motivation of business development and growth among entrepreneurs. In other words, entrepreneurs in Agriculture might be willing to achieve certain satisfying level of income, after which they stop business development. The satisfying approach in that case might be a reason of limited business development. This observation opens a research direction focused on existing entrepreneurs in Agriculture and their business development plans and prospects, limited by application of satisficing approach to decision criteria. The Policy Maker might be interested not only in the increase of the number of entrepreneurs in the sphere, but also in factors, which would motivate existing entrepreneurs to grow and develop.

5. CONCLUSION.

The survey brings several important conclusions, which demand deeper consideration.

According to the survey results, entrepreneurs in Agriculture are more devoted to their business sphere and less willing to change the industry, even if the future profits in another sphere are expected to be significantly higher. Non-hereditary Rural entrepreneurs give less importance to the pecuniary criteria in contrast to entrepreneurs from other business spheres.

This conclusion, together with existing literature on hereditary entrepreneurship results, presented in Part I (rural entrepreneurs are more motivated by the financial factors (Nielsen, 2010)), attract attention to the differences between hereditary and non-hereditary agricultural entrepreneurs value systems and criteria importance and specifically to the importance of non-pecuniary factors.

Another relevant result of the survey is the higher importance of Freedom and Social preference for the entrepreneurs in the sphere of Agriculture. The paper suggests additional research on the constituents of the criteria and possible approaches of application of the two non-pecuniary criteria importance in development of Agricultural entrepreneurship promotion methods.

The significant correlation between Realisation and Esteem importance for entrepreneurs in Agriculture assumes a considerable social component in entrepreneurs perception of self-realisation. and gives additional support to the utilisation of Agro-entrepreneurship promotion method, suggested in Part III of the Thesis.

The Survey revealed that entrepreneurs in Agriculture tend to apply the satisficing rule to financial determinants. The application of satisficing approach to Income might be a factor, which significantly decreases the agricultural business development. Deeper investigation of the issue is needed as well as development of methods, which would be directed to elimination of this negative effect.

If further research would confirm the application of satisficing rule by entrepreneurs in Agriculture and would discover its negative consequences on Agricultural business development, the importance of motivation of existing entrepreneurs in the sphere of Agriculture to extend and grow their businesses would receive additional confirmation.

Also further research is suggested on the impact of the geographical provenance of entrepreneurs on their perception of financial and nonfinancial factors importance.

REFERENCES.

1. (1996) “Russia in Numbers. Finance and Statistics”.
2. (2015) The Ministry of Agriculture of the Russian Federation website.
3. “The State Program of Development of Agriculture and Regulation of Markets for Agricultural Products, Raw Materials and Food for 2013-2020.”
4. Alsos, G, Carter, S, Ljunggren, E & Welter, F (2011) “Introduction: researching entrepreneurship in agriculture and rural development.” in GA Alsos , S Carter , E Ljunggren & F Welter (eds), The handbook of research on entrepreneurship in agriculture and rural development . *Elgar original reference, Cheltenham, pp. 1-20.*
5. Ananian, G. (2013) “Privatised Land Retention and Resale in Russia”. *Velikie Luki.*
6. Eliseeva, N., Bezborodov, A., Shestakova, V. (2010) “Perestroika and USSR Collapse. 1985-1993”. *Norma Publishing Group, Russian Federation.*
7. Faggio, G., Silva, O (2014) “Self-employment and Entrepreneurship in Urban and Rural Labour markets” *Journal of Urban Economics, 84: 67-85.*
8. Laquinta, D., Drescher, A. “Defining the peri-urban: rural-urban linkages and institutional connections.” *Food and Agriculture Organisation.*
9. Morton, A, Barbara, F. (2011) “Behavioral Decision Theory.” *London School of Economics, Management Department.*
10. Morton, A. (2011) “Introduction to Multicriteria Decision Analysis”. *London School of Economics and Political Science.*
11. Nielsen, K. L.,and Freire-Gibb, C. (2010). “How Important is Geography for the Entrepreneurial Profile?” *presented at the DRUID-DIME Academy Winter 2010 PhD Conference on Comwell Rebild Bakker*, Aalborg, Denmark, January 21 - 23.
12. OECD 2012 “Redefining “Urban”: A New Way to Measure Metropolitan Areas.” *OECD Publishing. Paris.*
13. Stathopoulou, S., Psaltopoulos, D. Skuras, D. (2004),"Rural Entrepreneurship in Europe" *International Journal of Entrepreneurial Behaviour & Research*, Vol. 10, pp. 404 – 425.
14. Strassner, C. et al (2015) “How the Organic Food System Supports Sustainable Diets and Translates These into Practice” *Frontiers in Nutrition. 2: 19.*
15. Weber M, Eisenfuhr, F. and Winterfeldt, D. (1988). “The Effects of Splitting Attributes on Weights in Multiattribute Utility Measurement”. *Management Science. Vol. 34 No 4, pp. 431–445.*

16. Weber, M. and Borcherding. K. (1993) "Behavioral Influences on Weight Judgments in Multiattribute Decision Making." *European Journal of Operational Research 67: 1–12.*