Analysis Tools of Connecting Investment Opportunities and Investment Means in the Area of Small and Medium-Sized Enterprises

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Abstract:

The process of doing business can be seen as a permanent link between investment means and investment opportunities. During this process ideas are generated, turned into business projects and implemented as innovations. In general, investment means and investment opportunities are joined together on mutually interconnected investment markets. This paper describes the preconditions for efficient operation of these markets, using mathematical analysis and a derived model, based on a theory of cooperative games. Barriers to the use of investment opportunities for SMEs are identified that are due either to the underdevelopment of some segments of the financial markets, or positional investment. Finally, specific recommendations for the support of small and medium-sized enterprises are made.

Key Words: *financial markets, investment opportunities, investment means, cooperative games*

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1. Introduction

Entrepreneurship is a form of investment in a number of investment opportunities. In a wider context, we can talk about various innovations taking different forms. Just starting a company is a form of investment, and so is its operation, investment in HR or market position, market development, development of new products, etc. An entity can be restricted in its use of investment opportunities, or even disabled, by various barriers. These barriers are closely connected to financing, either directly, via a budget restriction, or indirectly, via costs connected to overcoming these barriers. Small and medium-sized enterprises are at a disadvantage, compared to big companies, and many investment opportunities are not taken advantage of, due to these barriers.

SMEs are hugely important for the entire economy. For example, in the UK the sector of SMEs represents 99% of businesses and employs 81.6% people (The Telegraph, 2014). Worldwide, according to OECD, SMEs represent 95 to 99% of companies in different countries and represent 60-70% of jobs (OECD, 2006). Considering the importance of the SMEs segment, there are various forms of support, whose purpose is to eliminate this disadvantage, and to enable the implementation of investment opportunities also to entities, that do not have the relevant financial and operating capacities. This is a beneficial activity, however, fairly demanding in itself, and not fully suitable for small or starting businesses. Concurrently, there are many ways of how to fund these businesses in an innovative market method. This paper shows the opportunities and barriers associated with the use of a financial market in this area.

2. Literature Review

The issue of connecting investment means and investment opportunities is similar to the general issue of sharing restricted resources. Therefore, the source literature focuses either on sharing wealth (Moulin, 2003), or the theoretical issue of dividing shared water resources that is resolved using similar methodology as when dividing financial resources (Houba, 2013), (van den Brink, 2011).

The importance of small and medium-sized enterprises is supported by various articles (The Telegraph, 2014) and OECD publications (OECD, 2006). The theoretical basis and the importance of barriers for establishing a company strategy is based on a model by M. Porter (Porter, 1998), and specific examples are drawn from specific research (AMSP ČR, 2014) and (Hashi, 2001).

3. Barriers to Market Entry

Barriers to market entry are one of the factors determining the power of competition on the market. These aspects are analysed by the Porter model of five forces (Porter, 1998 p. 5) for the category of "risk of potential competition entry". The more

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barriers are built, the less competition forces affect the existing companies. These barriers have many forms and are created both intentionally, by the existing companies, or as part of company organisation, etc. The barriers can be divided into the following categories and examples:

- Natural (Geographical restrictions, Access to natural resources, etc.)
- Know-how and Experience (Know-how, Experience, Contacts, Processes, etc.).)
- Financial (Investment Demands, Access to Adequate Financing, etc.)
- Legal (Purposeful Legal Disputes, Complexity of Law and its Ignorance, Predictability of Judicial Decisions, etc.)
- Administrative (Rules and Instructions, Regulations, etc.)
- Operational (Savings based on Volume, Access to Distribution Channels, Transaction Costs, etc.)

Barriers generally protect existing companies on the market that have had the chance to adapt to the environment over time and become financially strong and have the means to overcome obstacles quickly. However, the list clearly shows that not even established companies have it easy - they just have a certain advantage which they have to maintain. Although the barriers take various forms, they are mutually intertwined. Nevertheless, ultimately they represent costs and in order to be overcome, funds are necessary. **Overcoming each barrier can be seen as using a certain investment opportunity. In case of perfect financial market operations, for each of the stated barriers (alternatively, even for other barriers) financial market mechanisms and tools would be created which would help to overcome the relevant barriers.**

In Chapter 4 opportunities for overcoming barriers will be presented. In Chapter 5 a barrier (snag) will be presented, which exists in the very foundations of the financial market. Identifying this snag is absolutely crucial for this issue. Each of the empiric forms of the actual barriers originates in this very snag. An important conclusion can be drawn from this - a common nominator for overcoming all barriers for SMEs to enter the market is improvement of the financial market with an emphasis on the issues that will be outlined in Chapter 5.

To illustrate, we will present a specific example. Subsidies and government support can only be drawn if an entity knows about these possibilities, and has the resources and capacity to request this type of support. For companies with just a few employees this can be an insurmountable barrier. This has been confirmed by a survey made amongst SMEs in Albania where most companies "had no idea about the accessibility of support programmes or assumed that they would not be able to use them anyway." (Hashi, 2001, p 230). Similarly, the survey by the Association of SMEs and the Crafts of the CR shows the following commentary: "Big entities logically apply for subsidies more often than small entities - they have the capacity, financial power and stability. However, this is not always the priority - to support the strong to grow even stronger." (AMSP ČR, 2014). We can imagine various tools of

the financial market which can overcome this barrier. However, they are not available at present.

4. Removal of Barriers

The above stated shows that the best support for SMEs is provided through activities which remove barriers and create an environment, where investment resources and investment opportunities can meet to improve the financial market. In terms of the removal of barriers, it is possible to divide the tools for the removal of barriers into several groups:

- Fixed - those that arise from fixed facts, such as geographic distance or life cycle of a company.
- Law and administration - those arising from legal and administrative facts.
- Knowledge - those that can be partially or fully removed through education and development of skills.
- Information - those where an improved flow of information can remove the barriers, or at least enable easier creation of contracts to implement investment opportunities.

For each of the groups, there are specific financial tools, which enable the relevant type of barrier to be overcome. In order to answer the question of how to develop the relevant financial tools, we will look at the relevant barriers in more detail.

The first category is more or less given, and to remove barriers of this category is not possible without major innovations. However, even geographic barriers are, to a substantial extent, removed thanks to sophisticated logistics, information technologies and worldwide globalisation.

The category of legal and administrative barriers is far more difficult. To support businesses, in particular SMEs, governments and political parties state in their political programmes that they will aim to reduce the administrative burden and to simplify the law. Currently, there is more emphasis on regulation improvement, and responding to negative events by creating new laws and rules, which in sum exceed the capacity of an individual, and for starting companies or small companies this can represent a major barrier.

Knowledge barriers can be overcome through different forms of education. For starting and small companies this is a challenge as this is not only about acquiring knowledge but also skills and experience, which are far more difficult to hand over. They are best acquired in practice.

There is a lot of scope, which has been left largely untouched, in acquiring, evaluating and sharing information. There are many opportunities for how information can support the implementation of investment opportunities in the SMEs segment, either in terms of simple sharing of information, uniform access to

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information, improved decision making about the forms of government support, improved calculation of benefits and costs, information on rules and regulations, and also enabling contracts thanks to different forms of connection (electronic stock exchange, market places, etc.). At the same time, there are forms of financing which correspond with the aforementioned theoretical model, and enable the use of investment opportunities that would otherwise have been left untouched.

In Europe, for several reasons bank loans represent the main form of financing. This has its reasons and advantages; on the other hand, it is hard to acquire bank loans without sufficient guarantees and business history. To a certain level, this is compensated by government subsidies and aid which is provided to the SMEs sector within European countries that help SMEs to access funds.

In the USA, funding using own capital is historically more common, either using individual investors, known as business angels, who enter companies at the start of the company in exchange for shares, or later using risk capital or issuing securities.

Recently, an interesting option of funding has opened up for projects in the first phases of the company life cycle. It is known as "crowdfunding", i.e., acquiring funds from a number of investors. This type of funding is mostly enabled by the development of new technologies and it has great opportunities. Most often, it takes the form of an internet auction when a person, offering a project, presents the project, explains which sum he/she needs to acquire, by when and what the investor will get for his/her money. This can either be future goods, a stake in the company or various creative forms of remuneration. The portal acts as a broker and it mediates contact between potential investors and those who need funds for a specific project. It is up to the presenter to sell the opportunity and convince potential investors. If the target amount cannot be gained in the time needed, the individual investments are returned to investors and the project fails.

One of the most famous crowdfunding portals in the USA is Kickstarter (https://www.kickstarter.com) and in the CR Startovač (https://www.startovac.cz), however, there are many similar portals. There are many projects on these portals that do not have much in common with business. However, there are also specialised portals such as Fundable (https://www.fundable.com) that directly focus of mediating funds for SMEs.

The method of financing using individual investors, risk capital and "crowdfunding" serves as a practical example of what our model shows. If the compensation is adequate, for the owners of funds it is more beneficial to provide some of their funds to those, who have more lucrative investment opportunities, to share the profit.

During the research, a model was proposed that offers a theoretical base and justification for looking for ways of how to mediate and enable the implementation of contracts in the area of sharing investment opportunities and means. This is

important for understanding the dynamics of financing and the development of financial markets, and also the decision making concerning rational programmes to support SMEs.

5. Model of Linking Investment Opportunities and Funds

A snag will be presented which exists in the very basis of the financial market. For the sake of simplicity, we will use a financial market with two entities; each of them has investment opportunities and investment funds. By linking a certain amount of investment means with a certain amount of investment opportunities, a yield is generated. The current income, which the economic entities have at their disposal, is considered to represent investment means. Any future income which they gain as a result of linking investment opportunities with investment means will represent the yield. We will assume that both economic entities will maximise their future yield, i.e., they will use investment opportunities based on their rate of return, i.e., the function of the marginal yield of investment opportunities is a non-increasing function throughout its defined field. The function of marginal yield from the investment opportunities of both entities is continuous; whilst the minimum of one of the functions is smaller than the maximum of the other function, and the maximum of the first function is higher than the minimum of the other function, see Fig. 1:
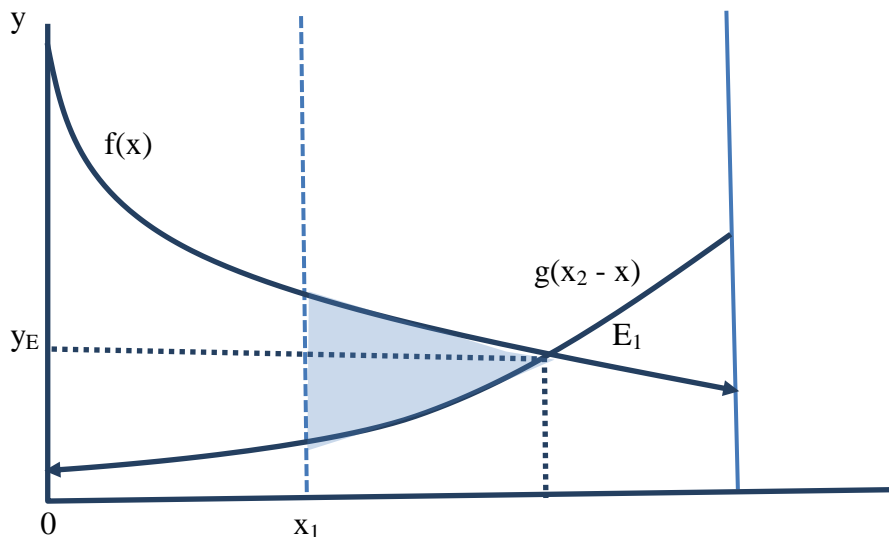

Figure 1. Supply and demand of investment means and investment opportunities
Source: Author

Where: x_1, x_2 - x_1 represent the quantity of investment funds which are available to the first and second economic subject, y represents the future yield in marginal values, $f(x)$, $g(x)$, alternatively $g(x_2$ - $x)$ non-decreasing continuous function of the

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marginal yield from investment opportunities, g(x) has been adjusted to express the relevant situation in a graph

$E_I(x_E, y_E)$ is a point where $f(x) = g(x) = f(x_2 - x) = g(x_2 - x)$, in this point all investment opportunities of both subjects have been utilised, based on the rate of return.

The light blue area shows the size of the maximum possible Paret improvement resulting from the operation of the financial market if one of the entities gives up its less profitable investment opportunities and provides funds to the other entity.
The overall yield of the first (similarly second) economic subject is:

$\int_0^{x_1} f(x)d(x) = \int_{x_1}^{x_2} f(x_2 - x)d(x)$, alternatively $\int_0^{x_1} g(x)d(x) = \int_{x_1}^{x_2} g(x_2 - x)d(x)$

If the price of investment funds is determined by the quality of marginal yields, i.e., by $f(x) = g(x)$, common investment opportunities of both subjects will be used based on the rate of return. The size of compensation for the entity that provided its investment funds to implement the investment opportunities of the other subject will be $y_E(x_E - x_1)$.

In terms of mathematical analysis, the problem seems to be resolved. This task represents a specific case of water division (water problem) with several specifying preconditions. For more information, see (Beal, 2013), (Brink, 2011), (Houba, 2013).

If both players reach the maximum payout at point *(y(1)$_E$, y(2)$_E$)* with the price for investment funds shown in Fig. 1 in a closed interval *(y1, y2)*, the assumption of individual rationality would suffice to consider the point *(y(1)$_E$, y(2)$_E$)* as an intuitively acceptable solution for a relevant cooperative task. However, this does not have to be the case, see Fig. 2.
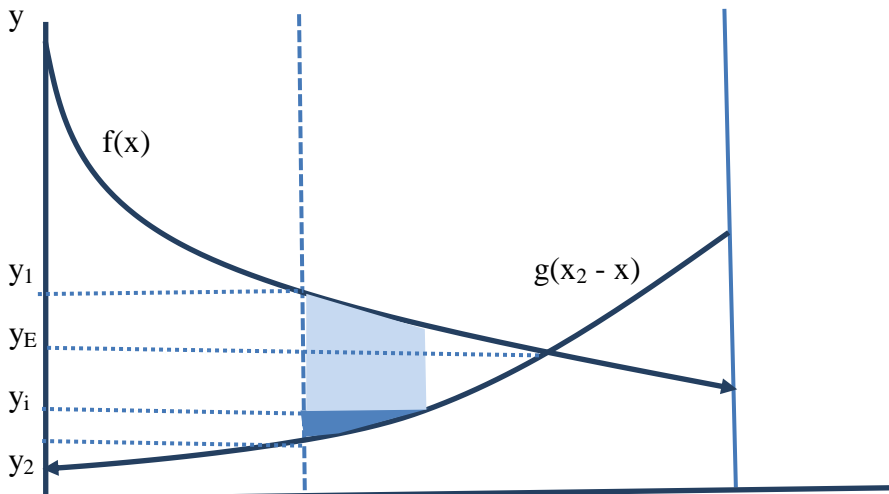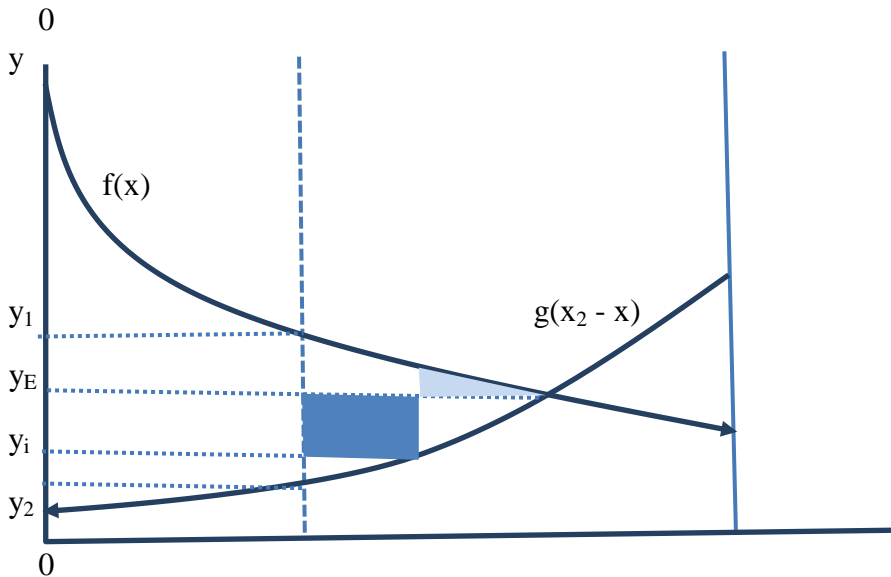
Figure 2. Payouts for players with changing prices of investment funds

Source: Author

The figure above shows the increase in the payout of the first and second player with the price of investment funds y_i. The figure below shows the change which would occur if the price of investment funds changed from y_i to y_E. The payout of the first player would decrease in this respective case compared to the payout of the second player. This is a significant moment. It is shown that in order to find a clear solution, the assumption of individual rationality does not suffice. Therefore, it is advisable to transfer this problem we have come across to the Nash (S, d) bargaining problem.
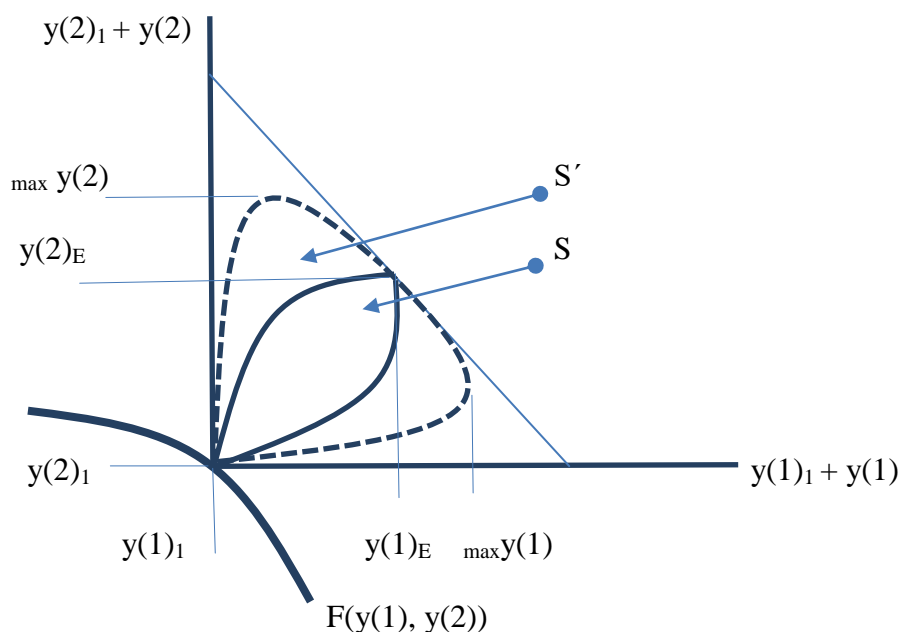
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Figure 3. Payout of players in case of changing prices of investment funds
Source: Author

S represents a set of possible ways of dividing the payout when $_{max}y(1)$ and $_{max}y(2)$ are smaller than $y(1)_E$ and $y(2)_E$. S´ is a set of possible ways to divide the payout when $_{max}y(1)$ and $_{max}y(2)$ are bigger than $y(1)_E$ and $y(2)_E$. The functions of Paret improvement can be seen in Graph 3. The full curve marks a case where $_{max}y(1)$ and $_{max}y(2)$ are smaller than $y(1)_E$ and $y(2)_E$, and the dashed curve marks a case where $_{max}y(1)$ and $_{max}y(2)$ are bigger than $y(1)_E$ and $y(2)_E$. In the first case (under the assumption that the price of the investment funds is constant and all investment opportunities are used, whose yield is bigger than this price) the solution of the relevant cooperative task is clearly determined by the assumption of individual rationality. In the second case, the assumption of individual rationality is not enough. A snag appears (a term introduced by us) when using investment opportunities. There are many ways of how to approach the solution of the relevant cooperative game. The snag which was defined on a general theoretical level is emphasised by the effect of many other real factors.

6. Results and Discussion

The theoretical model of financial markets shows both the opportunities and barriers (types of snag) happening when investment funds and investment opportunities meet. Further research will answer the question of the connection between the different types of company barriers to market entry which can be seen in practice

and which can be described based on an empirical analysis, and their general cause, which lies in the very foundations of the financial market.

Conclusion

Modelling financial markets using a mathematical analysis apparatus can be transferred into the form of cooperative games. In this form, some major aspects of their operation can be seen. Cooperative games have a transferrable benefit, some of them can present a solution to the Nash bargaining (S, d) problem, and some of them can be related to the issue of dividing a shared water source. Selecting a suitable model is connected to the interpretation of what we want to express and which task we are trying to resolve. The apparatus which we have developed enables us to present the issue of functioning and evolution of financial markets as part of a general type of tasks which focus on resolving issues connected with the removal of market barriers.

Acknowledgement

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