Aleksandra Gawęł , **Paweł Pisanko**

Poznań University of Economics and Business

The Influence of the Moral Hazard on the Entrepreneurial Activity

Introduction

Establishing a new company, as the essence of entrepreneurship (Santarelli, Vivarelli, 2007), requires, among other things, identification and acquisition of the initial set of resources. Access to the financial capital is one of the key factors of the new company creation process (Seghers et al., 2012; Grilo, Irigoyen, 2006). The concept of liquidity constraints formulated in the Evans-Janovic model (1989), developed by major researchers (see e.g. Roman et al., 2013; Hanley, Girma, 2006; Kan, Tsai, 2006; Cressy, 1999) constitutes a theoretical background of determining the influence of the financial capital on an enterprise.

With a hypothetically competitive financial market, the amount of loans for newly created enterprises would depend on the characteristics of the market and the company and would allow the capital supply to be adjusted to its price (Colombo, Grilli, 2007). However, in the modern economy, financial markets are not perfect – they are financially hierarchical, and the capital supply curve is highly inflexible, probably even perfectly inflexible (Colombo, Grilli, 2007). The dominant factors explaining the causes of imperfections are as follows: unfavorable selection, moral hazard, asymmetry of information, and the increasing or even vertical shape of the capital supply curve (Hyytinen, Vaananen, 2006; Colombo, Grilli, 2007; Blumberg, Letterie, 2008).

AG <https://orcid.org/0000-0002-7426-3474>, PP <https://orcid.org/0000-0002-1223-4651>

Moral hazard constitutes a particularly great research and practical challenge. The phenomenon of moral hazard, due to its nature, is more difficult to observe and to limit than other causes of imperfections. Moral hazard results from the fact that the success of a new enterprise depends heavily on the effort that the entrepreneur puts into the running of the company. However, this effort is not being evaluated by the lenders (Keuschnigg, Nielsen, 2004). After receiving external financing, entrepreneurs can avoid making the effort, work less efficiently than was assumed or take a higher risk from the financial point of view, and thus reduce the probability of success for their enterprise (Hyytinen, Vaananen, 2006; Blumberg, Letterie, 2008; Ejrnæs, Hochguertel, 2013; Atolia et al., 2015), exposing lenders to losses. In consequence, moral hazard reduces the optimum level of external investments in creation and development of new companies.

The main aim of this paper is to examine the influence of moral hazard on the process of new company creation and development by determining the areas of the company's operations within which the impact of moral hazard can be observed. The phenomenon of moral hazard is difficult to examine under real life conditions; therefore, an experiment was carried out in the form of a virtual strategy game. The participants of the experiment were Master's degree students at one of business universities in Poland and they were acting as founders and owners of virtual enterprises.

The structure of the chapter is the following: in the next sections the state of the art on the process of new company creation was reviewed and the influence of financial constraints, mostly moral hazard, on the entrepreneurial process. Then, the methodological aspects of the research are presented. The following section describes the results of the experiment and discusses the conclusions.

1. Entrepreneurial process and financial constraints as barriers for creating a new company

In the narrow sense, entrepreneurship is associated with the process of establishing and developing a new enterprise (Santarelli, Vivarelli, 2007). Creating a new business entity is a process resulting from a long series of complex decision-making rather than the single choice of becoming an entrepreneur (Grilo, Thurik, 2008). At the same time, it is a general process, since it includes elements common to all the processes of entrepreneurial character, but it is also a unique process, since it includes individual characteristics of entrepreneurial processes distinguishing them from other processes (Moroz, Hindle, 2012). Establishing a new company requires identification and acquisition of material and non-material resources that are indispensable to running a business. The initial set of resources affects not only the entrepreneurial process, but also has some influence on future access to other key resources (Hormiga et al., 2011).

The research on the establishment of new undertakings focuses on three main areas: the issue of the nascent entrepreneurs, related especially to the difference between future entrepreneurs and the remaining part of the population, and to the typology of future entrepreneurs; the characteristics of the process of creating a new enterprise, including the analysis of issues of perceiving and exploiting market opportunities, activities necessary to start a new business or differentiation at market entry; the results of the process of creating a new company in terms of its market success, durability and progress made at market entry (Davidsson, Gordon, 2012; Hormiga et al., 2011).

The issue of the influence of moral hazard on the entrepreneurial process discussed in this paper is multidimensional. Moral hazard may be understood as a certain attitude of entrepreneurs, occurring when the financial risk is taken by external investors. In this meaning, it is an attribute of entrepreneurs; however, its consequences lead to restricted access to external financing, which is a key resource in the process of creating a company. Making an effort or avoiding it in the scope of moral hazard also affects the process of creating an enterprise and its performance.

In the current literature, moral hazard is explained as a phenomenon of the financial market, where access to financial capital is treated as one of the major determinants of the entrepreneurial process. The concept of liquidity constraints formulated in the Evans-Janovic model (1989), developed by major researchers (see e.g. Roman et al., 2013; Hanley, Girma, 2006; Kan, Tsai, 2006; Cressy, 1999) constitutes a theoretical background of determining the influence of the financial capital on an enterprise. The model indicates that access to financial capital is a key factor in creating a new enterprise, and the existing constraints lead to a situation in which people with access to financial capital may engage it into a new enterprise. The liquidity constraints exclude people who lack financial capital from entrepreneurship (Evans, Jovanovic, 1989).

Decisions on financial expenditures are among the key decisions of entrepreneurial processes (Seghers et al., 2012). According to survey results, most of the respondents consider the lack of sufficient financial capital a significant constraint to starting a new enterprise (Grilo, Irigoyen, 2006). At the same time, the results indicate that a higher financial outlay translates into a better process of creating a new company, its growth and the time it will stay on the market (Reynolds 2011), while helping to overcome other entry barriers, such as regulations within the labor market or company registration (Aghion et al., 2007). Macroeconomic situation related to business cycle also affects the level of operating risk (Kalinowski, Puziak, 2018).

If the financial market was perfectly competitive, the problem of access to the financial capital would not determine the process of creating new enterprises. With a hypothetically competitive financial market, the amount of loans for newly created enterprises would depend on the characteristics of the market and the company. These characteristics determine the shape of the demand curve for capital. There would be a flexible capital supply curve that would allow the capital supply to be adjusted to its price (Colombo, Grilli, 2007). However, in the modern

economy, financial markets are not perfect – they are financially hierarchical, and the capital supply curve is highly inflexible, probably even perfectly inflexible (Colombo, Grilli, 2007).

The literature does not indicate one theory explaining the causes of imperfections in financial markets. The dominant factors explaining the causes of imperfections are as follows: unfavorable selection, moral hazard, asymmetry of information, and the increasing or vertical shape of the capital supply curve (Hyytinen, Vaananen, 2006; Colombo, Grilli, 2007; Blumberg, Letterie, 2008).

The unfavorable selection results from the fact that lenders analyzing the pool of enterprises applying for external financing are not able to distinguish between good and bad companies; therefore, more enterprises are being financed than the financial analysis would indicate. As a result, possible losses from investing in wrong enterprises can be offset by the profits from the right investments (Hyytinen, Vaananen, 2006). However, the price of capital is higher than the market mechanism would suggest, because the financial institutions' profits from the right investments should cover not only the investments they were involved in, but also unsuccessful projects.

Moral hazard results from the behavior of entrepreneurs, which is not being evaluated by lenders. There is a danger that companies using external financing may use the funds received against the intended purpose. The entrepreneur may work less efficiently than was assumed or take higher-than-optimal risks from the financial point of view (Hyytinen, Vaananen, 2006; Blumberg, Letterie, 2008).

In addition, the issue of negative selection and moral hazard may be complementary to each other, i.e. the bad company also behaves in a suboptimal manner (Hyytinen, Vaananen, 2006).

Asymmetry of information occurs when lenders have less knowledge about the quality of the planned enterprise than the potential entrepreneur. It is the result of the process of data collection and its costs, as well as the quality of these data. Gathering information is a time-consuming and costly activity, and in the case of a newly created company, these costs are higher due to the lack of business and credit history (Blumberg, Letterie, 2008).

Barriers in access to finance occur partly due to the supply side of the market. Banks are cautious in granting loans to enterprises, particularly to small and newly created companies (Blumberg, Letterie, 2008). The occurrence of financial barriers is conditioned by the structure of this market, including the number of operating banks and lenders in a given area, which affects competition between them. The relatively high market power of banks may negatively affect the value of granted loans and result in higher interest rates, which increases the cost of loans and reduces their availability for newly-created companies. Such an attitude from the banks may limit the scale of the process of creating new enterprises. On the other hand, the moderately-concentrated banking market positively affects the creation of new enterprises, as competition between banks reduces the negative phenomena (Gagliardi, 2009). The limitation of investments of financial institutions in the newly created enterprises results from the uncertainty of their future success and from the existing risk of failure (Koski, Pajarinen, 2013).

The consequence of the existence of liquidity constraints is that the majority of entrepreneurs starting their own businesses rely on their own financial resources in the early stages of the development of their companies (Stuart, Sorenson 2003), which results in the correlation between the formation of new enterprises and available assets (Hanley, Girma, 2006).

2. Moral hazard in theoretical explanation of financial constrains

Among the phenomena affecting financial constraints, moral hazard constitutes a particularly great research and practical challenge. Other limitations are relatively easily to overcome by improving the efficiency of data collection on new projects (asymmetry of information) and improving project evaluation methods (negative selection) or increasing the support of institutions financing newly-created enterprises. Such actions may be undertaken as part of a policy for promotion of entrepreneurship (supply of financial resources for newly created enterprises). However, the phenomenon of moral hazard, due to its nature, is more difficult to observe and to limit.

Moral hazard results from the fact that the success of a new enterprise depends heavily on the effort that the entrepreneur engages in the running of the company. However, this effort is not being evaluated by the lenders (Keuschnigg, Nielsen, 2004). After receiving external financing, entrepreneurs can avoid making the effort and thus reduce the probability of success for their enterprise (Atoia et al., 2015), exposing lenders to losses.

Moral hazard is a kind of behavior that in the business context involves taking either excessive risks or insufficient precautions against business failure. It is perceived as a lack of effort to prevent business failure, which results from possessing some security measures (Ejrnæs, Hochguertel, 2013). With external financing, the risk of financial loss resulting from the failure of the project is passed onto lenders, despite the fact that it depends on the efforts of entrepreneurs.

The loan restrictions depend on the degree to which lenders are able to identify the entrepreneurial risk and the tendency of entrepreneurs to cheat. The involvement of entrepreneur's own financial capital reduces their inclination to fraud; hence, the wealth of the entrepreneur is positively correlated with their decision to launch a new enterprise. Entrepreneurs' private financial assets have a positive impact on the company's survival through the limitation of financial barriers (Schafer, Talavera, 2009).

Empirical studies supporting the argument of the occurrence of moral hazard indicate that self-employed people who function in a system in which the insurance mechanism partially protects them against the loss of income have a bigger tendency to take on greater risks (Ejrnæs, Hochguertel, 2013).

The theoretical model explaining the mechanism of moral hazard assumes that the future entrepreneur needs external financing to start a new undertaking that is potentially productive and efficient. The efficiency depends on the effort

put in by the entrepreneur, which depends on the terms of the financial contract. If the entrepreneur puts in relatively little effort, then the venture is inefficient, i.e. the expected product does not cover the resources used. With high effort, the enterprise obtains a net product (Reito, 2011), allowing for a return on investment and entrepreneurial success.

The problem of moral hazard can also be considered in the context of principal-agent theory. This theory assumes that one actor (the principal) provides resources, often on the contract basis, to another actor (the agent), whose task is to accomplish the goal, which would be impossible to achieve independently by the principal (Rasmussen, Gulbrandsen, 2012). The entrepreneur is in the position of an agent using financing and providing an effective undertaking, while the lender assumes the role of the principal, providing external financing and awaiting the results of the efforts made by the entrepreneur.

There are three groups of problems indicated within this theory. The first problem concerns the conflict of goals set by the principal and agents, which often contradict each other. The second problem, referred to as adverse selection, is related to finding the right agent to achieve the goal. The third problem is moral hazard: the agent has an incentive not only to perform the agreed task, but also to act in an unacceptable way through undue effort put into a venture (Rasmussen, Gulbrandsen, 2012). Maziarz (2019) proposes to add also tacit factors to moral hazard explanation. In light of the relationship between the entrepreneur and the investor, it can be concluded that the conflict of goals may result from the fact that the goal of the lender is to maximize the return on investment, and the entrepreneur's goal may be to minimize efforts. Adverse selection is due to the fact that a lender can invest in various ventures, generating expected profits on a volatile level and of a different risk of failure. On the other hand, the problem of moral hazard indicates the necessity of entrepreneurial effort in the development of a new venture, which is impossible to observe and control by the lender. However, it is crucial for the success of the undertaking. External financing increases the tendency to behave in a riskier way among entrepreneurs.

Another model referring to this problem is the occupational choice model with financial constraints, tested by Paulson et al., (2006). It assumes that there are two financial constraints: limited liability and moral hazard. What is more, those constraints may influence each other as well. Limited liability arises when a potential entrepreneur has to borrow funds for establishing and running a business. The increase in wealth means that they can borrow a higher amount of money. However, when the phenomenon of moral hazard occurs, the entrepreneurial effort is invisible to the lender and the loan is returned only when the entrepreneur is successful; therefore, the lenders raise the interest rate on loans for less affluent entrepreneurs (Paulson et al., 2006). Research results indicate that moral hazard is a key financial constraint. It affects both entry into entrepreneurship by itself only or jointly with limited liability. Limited liability affects entrepreneurship entries only together with moral hazard, however (Paulson et al., 2006).

3. Methodology: experiments in assessing the influence of moral hazard on entrepreneurial process

Moral hazard is therefore understood as the lack of proper entrepreneurial effort and taking excessive risk after having received external financing. The research problem raised in the paper is to determine the areas of the company's operation within which the impact of moral hazard can be observed. The following research hypotheses were put forward:

- Hypothesis 1: Moral hazard leads to overinvestment in the enterprise.
- Hypothesis 2: Moral hazard results in excessive costs for companies.
- Hypothesis 3: Sales revenues of enterprises are reduced by the impact of moral hazard.
- Hypothesis 4: Moral hazard reduces the company's financial effectiveness.

It was assumed that lack of entrepreneurial effort and excessive risk-taking as manifestations of moral hazard cause entrepreneurs with external financing to invest excessively in their undertakings and incur excessive operating costs. At the same time, they do not attach such importance to gaining customers as they could, because their activities are based more on external financing instead of on sales revenues. The consequence of the above is lower financial efficiency for the company.

Moral hazard is difficult to measure, which also makes it difficult to empirically test it. This phenomenon is difficult or even impossible to observe directly, and for that reason, an indirect form to analyze it was adopted. The present study was based on an experimental method, according to the suggestion that it is the right method to assess theoretical assumptions for those phenomena which are difficult to verify empirically (Di Cagno, Spallone, 2012).

Di Cagno & Spallone (2012) used a lottery-based experiment in their research on the issues related to the fall of entrepreneurial companies due to the occurrence of moral hazard. The same approach was used in the presented study: it was based on the business simulation of running a virtual enterprise. Participants were put in the role of entrepreneurs and asked to run a virtual company through several decision rounds. The experiment was carried out using software: The Strategic Management Game. Thanks to this, all participants of the experiment started with exactly the same possibilities of making entrepreneurial decisions, thus making results comparable. It was also possible to implement research attitudes with different rewarding systems to investigate the importance of moral hazard.

The experiment took place in 2017 and 2018 and was arranged at Poznan University of Economics and Business (PUEB). PUEB is one of the business universities in Poland. Studies and research concentrate only on management and economic sciences which situates its students among business-oriented people, preparing and starting their professional careers in management and entrepreneurship. The experiment was carried out among the 1st year Master's-level

students of economic studies in 2 specializations: Innovation Management and International Business. Students took the course of entrepreneurship based on the strategic management game, a business simulator developed within the Leonardo da Vinci Program, as their mandatory subject.

The students were divided into 2 cohorts: cohort MH, affected by moral hazard (30 students) and cohort no-MH, with reduced moral hazard (33 students). Each cohort was further divided into student groups based on the Belbin Self-Perception Inventory. There were 9 groups in cohort MH and 10 groups in cohort no-MH; each group consisted of 3 to 4 students. During the simulation game, each team of students became virtual entrepreneurs who established and ran virtual companies producing and selling chocolate in 4 markets (Poland, Romania, Austria and Switzerland) and competed against each other for the wallets of 4 target groups with distinct preferences. The players needed to make strategic management decisions covering sales office development, production lines development, product design, operations, pricing, advertising, logistics, and HR, which in the end influenced the sales result of each company. The game consisted of 10 rounds (1 introductory round and 9 sales rounds). The students had no time limits related to making and changing decisions, because the rounds were completed once a week, during which the students had unlimited access to the game. The experiment was designed in such a way that any changes in students' decisions within one decision round did not entail any additional costs.

The moral hazard effect was implemented and tested during the experiment through the system of rewarding points which affected the students' final grade. The assumption was that the final grades received after each course at the university have the most important motivational power for students. With the whole respect to all differences, students' final grades were treated as rewards equivalent to entrepreneurial profits. In general, students' grades in both cohorts depended on two aspects:

1. Results of business simulation game regarding the results of virtual sales (value of sales) and the financial balance gained by the virtual companies – 70% of the grade
2. Additional tasks fulfilled by students during the semester – 30% of the grade.

Each round, each group received points depending on the sales performance (based on the ranking of companies) and game activity. At the end of the game, each group received additional points for the final financial balance on the company accounts. Financial balance in the simulation game is calculated as the cash flow, all revenues and spending influence on it, no matter their source. Every group started the game with the same amount of money – PLN 3,000,000, and the same set of assets: 1 production line, and equal unlimited access to the markets, resources and providers of ingredients.

The phenomenon of moral hazard was introduced in the grading system for two cohorts by different models of gaining points for the final financial balance. Cohort MH, assumed to be influenced by moral hazard, received points based on the companies' ranking of financial balance (max. 7 points, min. 4 points),

whereas cohort no-MH, assumed to have reduced moral hazard, received 1 point for each PLN 1 million collected on the virtual accounts; however, it might have been negative, should they end the game with a negative balance (max. 15 points, min. -15 points). Thus, cohort MH students were not subject to current mechanisms controlling their financial performance activities, and the current negative financial results did not have a direct impact on their final grade. Therefore, it was assumed that the behavior of this group is naturally affected by moral hazard and that these students were more likely to demonstrate excessive risk and avoid making an effort, which was not systematically controlled or did not influence the final grade of the course. On the other hand, students from the cohort no-MH were subject to the current mechanisms of controlling their effort and risk through negative points attributed when they had a financial loss, which affected their final grade. It was assumed that such conduct leads to the limitation of risky behavior and encourages greater effort in the business simulation and, therefore, reduces the scale of moral hazard.

In order to refer to the research hypotheses, the results of groups of students from both cohorts were analyzed. The analysis of the financial reports shows differences in the approach of financial capital management that was obtained externally, and therefore with moral hazard connected to it. The results of the experiment are evaluated in aspects such as investments in sales offices, investments in production lines, investments in product development, human resources, operations, warehousing, sales value and final financial balance.

4. Research results: does moral hazard shape the entrepreneurial process?

The analysis was based on the average result of companies from each cohort. Results gained during the experiment cannot be compared with real life companies, as the simulation game implemented some simplifications to make the game playable. As students took part in the same simulation game with the only difference being the rewarding point system influencing the final grade, the results of the two cohorts can be compared to each other. Final balance is calculated in terms of cash flow, which is why all the spending, including investments, negatively influence the balance, and income, including disinvestments or salvage, influence it positively. The presentation of results follows this logic.

Each team started the game without any sales office and had to make decisions about the location(s) and size of new sales offices. There were 4 locations available (Poland, Romania, Austria and Switzerland) and 3 sizes of the sales offices (small, medium and large). There were no limitations regarding the decisions. The game makes it possible to develop the sales office in later turns: from the small one to the medium or large one, or from the medium one to the large one. It is less expensive to develop the sales offices gradually than to invest in the large one at the

Chart 1. Sales offices – investments and divestments

Source: authors' estimation based on experiment results.

beginning. Although upgrading is possible, downgrading is not. The only possibility is to sell the office and invest in a new smaller one; however, the sales result in the loss of capital – the selling price of the office is lower than the investment.

Cohort MH spent almost 3 times as much as cohort no-MH for setting up the sales offices, which means they opened either more or bigger offices and spent money easier. Cohort MH was 6.5 times more prone to take the risk of opening large offices. Both groups were quite consistent with the enlargement of the sales offices; cohort MH spent on average 18% more than cohort no-MH. What is interesting is the fact that cohort MH sold offices worth almost 15 times more than cohort no-MH. It was the result of overinvestments – they sold 13 offices (including 12 large ones), whereas cohort no-MH sold only 5 offices (no large offices sold). In the end, summing all the investments and divestments, both cohorts spent a similar amount of money, with cohort no-MH spending slightly more (12.87%) than cohort no-MH. However, cohort no-MH was more cautious and spent money in a less risky way.

Opposite to the sales offices, each team started the game with one small basic production line, located in Warsaw, Poland (the default and only possible production location), that could be modified based on volume and product composition. The usage of the production line depends on the products and company strategy. Production lines may be developed in terms of size (small, medium, large) and product compatibility. It is also possible to sell them (again for a lower price).

Cohort MH spent almost 60% more for production line set up, meaning they either opened more lines, developed them to a bigger size or developed their production capacity to a bigger extent. Cohort MH also spent more money on the production line development – 34% more than cohort no-MH. Similarly, to

Chart 2. Production lines – investments and divestments Source: authors' estimation based on experiment results.

the case of the sales offices, it is possible to observe overinvestment of companies in cohort MH, as the value of assets sold during the game was 2.5 time higher than in the case of companies in cohort no-MH. All in all, it is again possible to observe that cohort MH was more prone to spend money in a riskier and less efficient way.

All the groups started the game without any products available. Their task was to design products, matching preferences of 4 target groups within 3 parameters describing the quality of the product. The parameters had values from 1 to 10. There were 1,000 different combinations of products possible. The sensitivity of each target group to each parameter and target group composition was

Chart 3. Product development – investments Source: authors' estimation based on experiment results.

presented to the players in the game scenario, before the game started. Once set up, the products could be also developed in the later rounds.

Even though the total spending for both groups is similar, the spending pattern in the first-round shows differences in approach and behavior.

In order to maximize the profits and chances to fit the target group preferences, as well as to mitigate against the risk of failure, the companies of cohort no-MH introduced more products to the markets.

The range of decisions within human resources included: hiring production workers and sales office employees, setting up their salaries, choosing benefits and trainings. All of these parameters had an influence on the employees' productivity, i.e. the amount of chocolate bars produced and sold within the offered employment conditions. Players should have adjusted those parameters to achieve highest profitability and cost optimization.

Although the costs of training and benefits were similar in both groups, the level of salaries differed significantly – companies in cohort MH spent 50% more on salaries than cohort no-MH, which shows they were less efficient in this respect. Their production and sales facilities were either overemployed or the salaries were too high.

Costs covered by operations include production and product transfers. Production cost depends on the parameters of products, choice of suppliers and volume of production. Product transfer is the cost of transferring chocolate bars units between the factory and sales offices, but also between sales offices. Players may optimize the costs by the choice of the supplier (depending on the product portfolio), calculating the accurate volume of production (e.g. avoiding over-production) and efficient logistics.

Chart 4. Human resources – costs
Source: authors' estimation based on experiment results.

Chart 5. Production, transport, warehousing – costs

Source: authors' estimation based on experiment results.

Companies of cohort MH were less efficient in operational planning as they spent 66% more on the production (either by choosing suboptimal suppliers or through overproduction) and excessive product transfers (67% more than cohort no-MH).

The average sales capacity (size of the offices per company) was 65% higher in cohort MH – this was a result of overinvestment. However, on average, they produced only 31% chocolate bars per round more than cohort no-MH. The average production to capacity ration was lower by 15% in cohort MH, which indicates that sales offices were filled with products that were not sold in the previous round or the teams were not using their production capabilities to the fullest. The average number of goods that were not sent to the sales offices per round was more than 3 times higher in cohort no-MH, indicating that they were less efficient with stock management.

Every time a chocolate bar is not sold during the round or is left in the main warehouse, the players bear an additional cost of warehousing per each unsold item. The factors influencing the costs of warehousing are as follows: unsatisfied target group preferences, overproduction or unmatched salesforce. The warehousing costs incurred by cohort MH were 189% higher than those incurred by cohort no-MH, which again shows its lower efficiency when compared with the other cohort.

Sales result in terms of value of sales, i.e. the biggest income, was the most important objective for all the groups, as it contributed the most to the final

Chart 6. Total average sales result
Source: authors’ estimation based on experiment results.

grade. Players earned money based on the fit of their products into target groups’ preferences.

With significantly higher costs and riskier approach, companies of cohort MH earned on average only 4 percent more than companies of cohort MH.

Final balance is the amount of money collected on the virtual accounts of companies after the final round had been closed. It is calculated in terms of cash flow, as all revenues and spending have influence on it, disregarding their nature. This is the only component that differed in terms of its influence on the final grade of the students. Students from cohort MH received points disregarding the actual amount of money collected, the only thing that mattered was the ranking among the teams. Students from cohort no-MH received points based on the result of each company independently, and in case of a negative balance, they

Chart 7. Average financial balance by round
Source: authors’ estimation based on experiment results.

Chart 8. Main differences in results of experiment between MH and no-MH cohort of students (Cohort no-MH = 100%)

Source: authors' estimation based on experiment results.

received negative points. The difference in the grading approach enabled observation of the influence of moral hazard on both cohorts.

Companies of cohort no-MH risked not only external investors' money, but also their grades (being equivalent to their own contribution to the company). Companies of this cohort, despite slightly lower sales, were able to make a higher profit (on average 94% higher) than companies of cohort MH. What is more, companies of cohort MH were more frequently in debt, and it took them on average 5 rounds to regain the lost capital, whereas companies of cohort MH were able to regain positive balance in the following round. 22% of the companies in cohort MH finished the game with a negative balance, whereas all the companies of cohort no-MH finished the game with a positive balance.

To sum up, the basic comparison of experiment results is presented at chart 8.

Students in cohort no-MH, with moral hazard reduced by more strict controlling activities and penalties for risky behavior, had a final financial balance at the end of simulation game that was almost twice as high as the other cohort's balance. It was achieved thanks to more careful and less risky decisions regarding costs, better adjustment of production and sales capacities together with operational spending. These financial results were gained even though the sales revenues were at quite similar levels.

5. Conclusions

The aim of the paper was to analyze the impact of moral hazard on the entrepreneurial process, based on the experiment as the research method. Moral hazard is a phenomenon raising financial constraints and reducing the level of external investment in newly created and developing companies. The experiment was

conducted in Poland, among students of one of the leading business universities. Poland was chosen for the experiment, as it is a country of a relatively high level of entrepreneurship and a high level of private equity investment.

Addressing the main aim of the paper, experiment results show that moral hazard impacts the process of new company creation and development mostly by shaping less risky and more comprehensive decisions in operational costs and adjustment of operational spending, production and sales capacities. The results of the experiment based on the business simulation game answer the hypotheses of the paper. Moral hazard is correlated with overinvestment, which was observed in the comparative analysis of investment tendencies between cohorts. Cohort MH overinvested in the sales offices, and they were more prone to open bigger and more expensive offices, which were later sold. This triggered overinvestment in production lines to provide production capacity to stock up the offices (these production lines were also sold later) and in production itself – cohort MH produced more goods that were not sold. Hypothesis 1, assuming that moral hazard leads to overinvestment in the enterprise, was supported.

Higher operational costs are strictly connected to overinvestment. Buying bigger offices requires adjusting the volume of production (more or bigger production lines), leads to an increase in salaries (more employees in sales offices and in the factory), costs of logistics (more goods to transport) and warehousing (more unsold goods to stock). The results provided support for accepting the second hypothesis, assuming that moral hazard leads to incurring excessive costs.

Both cohorts achieved similar sales results, which gives a negative answer to the third hypothesis. Moral hazard seems not to affect sale income, as both cohorts of students gained similar sales revenues. In consequence, the most important seems to be the answer for the last research hypothesis about the financial effectiveness. The companies of cohort no-MH were nearly 100% more efficient financially; thanks to less risky investment behavior and higher efficiency, they achieved significantly higher returns on investments than cohort MH, which proves that moral hazard decreases financial effectiveness of a company, supporting hypothesis 4.

The experiment was conducted in Poland, among business students of one of the leading Polish economic and business universities. It can be assumed that both the higher education system and business culture in Poland influenced the behavior of students. To confirm these findings, a similar experiment should be conducted in other countries, including CEE.

Although the research results should be treated as preliminary ones, but they give some indications for entrepreneurial education. Students seems to have a natural tendency to moral hazard, which may lead to too risky business activities in the future. Therefore, responsible entrepreneurial education should be shaped in this way to make students aware of the business risks of moral hazard and reduce its occurrence.

References

- Aghion, P., Fally, T., & Scarpetta, S. (2007). Credit Constraints as a barrier to the entry and post-entry growth of firms. *Economic Policy*, 22, 731–779.
- Atolia, M., Einarsson, T., & Marquis, M. (2015). Equilibrium Shirking, Access To Credit And Endogenous TFP Fluctuations. *Economica*, 82, 486–507. Doi:10.1111/Ecca.12122.
- Blumberg, B. F., & Letteries, W. A. (2008). Business Starters and Credit Rationing. *Small Business Economics*, 30, 187–200.
- Colombo, M. G., & Grilli, L. (2007). Funding Gaps? Access To Bank Loans By High-Tech Start-Ups. *Small Business Economics*, 29, 25–46.
- Cressy, R. (1999). The Evans and Jovanovic Equivalence Theorem and Credit Rationing: Another Look. *Small Business Economics*, 12, 295–297.
- Davidsson, P., & Gordon, S. R. (2012). Panel studies of new venture creation: a methods – focused review and suggestions for future research. *Small Business Economics*, 39, 853–876.
- Di Cagno, D., & Spallone, M. (2012). An experimental investigation on optimal bankruptcy laws. *European Journal of Law and Economics*, 33, 205–229. <https://doi.org/10.1007/s10657-010-9161-3>
- Ejrnæs, M., & Hochguertel, S. (2013). Is Business Failure Due To Lack Of Effort? Empirical Evidence From A Large Administrative Sample. *The Economic Journal*, 123, 791–830. <https://doi.org/10.1111/ecoj.12026>
- Evans, D. S., & Jovanovic, B. (1989). An Estimated Model of Entrepreneurial Choice under Liquidity Constraints. *Journal of Political Economy*, 97(4), 808–827.
- Gagliardi, F. (2009). Banking Market Structure, Creation and Activity of Firms: Early Evidence for Cooperative in the Italian Case. *Annals of Public and Cooperative Economics*, 80(4), 605–640.
- Grilo, I., & Irigoyen, J.-M. (2006). Entrepreneurship in EU: To wish and not to be. *Small Business Economics*, 26, 305–318.
- Grilo, I., & Thurik, R. (2008). Determinants of entrepreneurial engagement levels in Europe and the US. *Industrial and Corporate Change*, 17(6), 1113–1145.
- Hanley, A., & Girma, S. (2006). New Ventures and Their Credit Terms. *Small Business Economics*, 26, 351–364.
- Hormiga, E., Batista-Canino, R. M., & Sanchez-Medina, A. (2011). The Impact of Relational Capital on the Success of New Business Start-ups. *Journal of Small Business Management*, 49(4), 617–638.
- Hyttinen, A., & Vaananen, L. (2006). Where Do Financial Constraints Originate from? An Empirical Analysis of Adverse Selection and Moral Hazard in Capital Markets. *Small Business Economics*, 27, 323–348.
- Kalinowski, S., & Puziak, M. (2018). Does a financial crisis affect operating risk? Evidence from Polish listed companies. *Economics and Business Review*, 18(1), 64–85. <https://doi.org/10.18559/eb.2018.1.5>
- Kan, K., & Tsai, W.-D. (2006). Entrepreneurship and Risk Aversion. *Small Business Economics*, 26, 465–474.
- Keuschnigg, Ch., & Nielsen, B. S. (2004). Progressive Taxation, Moral Hazard, and Entrepreneurship. *Journal of Public Economic Theory*, 6(3), 471–490.
- Koski, H., & Pajarinen, M. (2013). The role of business subsidies in job creation of start-ups, gazelles and incumbents. *Small Business Management*, 41, 195–214.

- Maziarz, M. (2019). A disequilibrium mechanism: When managerial decisions cause macroeconomic instability. *Economics and Business Review*, 19(1), 79–92. <https://doi.org/10.18559/ebr.2019.1.5>
- Moroz, P. W., & Hindle, K. (2012). Entrepreneurship as a Process: Towards Harmonizing Multiple Perspectives. *Entrepreneurship: Theory and Practice*, 36(4), 781–818.
- Paulson, A. L., Townsend, R. M., & Karaivanov, A. (2006). Distinguishing Limited Liability from Moral Hazard in a Model of Entrepreneurship. *Journal of Political Economy*, 114(1), 100–144.
- Rasmussen, E., & Gulbrandsen, M. (2012). Government Support Programmes To Promote Academic Entrepreneurship: A Principal-Agent Perspective. *European Planning Studies*, 20(4), 527–546.
- Reito, F. (2011). Unproductive Investment and Rent Extraction. *Bulletin of Economic Research*, 63(3), 213–230. <https://doi.org/10.1111/J.1467-8586.2009.00338.X>
- Reynolds, P. D. (2011). Informal and Early Formal Financial Support in the Business Creation Process: Exploration with PSED II Data Set. *Journal of Small Business Management*, 49(1), 27–54.
- Roman, C., Congregado, E., & Millan, J. M. (2013). Start-up incentives: Entrepreneurship policy or active labour market programme? *Journal of Business Venturing*, 28, 151–175.
- Santarelli, E., & Vivarelli, M. (2007). Entrepreneurship and the process of firms' entry, survival and growth. *Industrial and Corporate Change*, 16(3), 455–488.
- Schafer, D., & Talavera, O. (2009). Small business survival and inheritance: evidence from Germany. *Small Business Economics*, 32, 95–109. <https://doi.org/10.1007/s11187-007-9069-7>
- Seghers, A., Manigart S., & Uanacker, T. (2012). The Impact of Human and Social Capital on Entrepreneurs' Knowledge of Finance Alternatives. *Journal of Small Business Management*, 50(1), 63–86.
- Stuart, T. E., & Sorenson, O. (2003). Liquidity Events and the Geographic Distribution of Entrepreneurial Activity. *Administrative Science Quarterly*, 48, 175–201.