Credit Risk Evaluation in the Small Business Activity: Individual Aspects at the Macroeconomic Level

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The key area of the controversy among researchers is the potential impact of the small business activity on the national economic growth. The background of such a prerequisite lies in the Schumpeterian hypothesis, which marks out the role of an entrepreneur as an inevitable element for the technological innovation. In this way the growing Gross Domestic Product (GDP) is fungible with the progress and well-being improvement. However, last events showed that high growth rates and favourable competitiveness indicators were not the cure for the financial distress in the era of globalization.

Following this idea, one should take the role of the small business activity into consideration not only with respect to its potential growth input, but also as a possible «economic cushion» that mitigates the overall risk in the economy. Such a view on the problem is hugely exacerbated especially during the periods of economic downturn.

With this in mind the main objective of the paper is to identify basic risk factors perceived by small businesses, which impede the early entrepreneurial development as well as to draw a line between risk perception by entrepreneurs and economic progress. Additionally, the focus is intended to provide a rationale for a leading indicator construction, which is able to anticipate possible economic downturn. This issue is based on the assumption that early entrepreneurial activity is the most susceptible to the economic fluctuations structure.

The scope of the research is confined to the early business activity and the financing problem in particular. The opportunity to attract financial funds enables an entrepreneur to put the business into action, thus drawing the line between bright idea and the first material step towards its realization. Among various dimensions of small business support the financial issue is the most challenging and urgent component of every start-up.

To shed more light on the subject of the small business financing and its impact on the socioeconomic development of a country, one should take a structured approach:

Firstly, it is necessary to drill down into the background of the assumption that the small business activity fosters the GDP growth. Moreover it is important to bring on the surface the explanation of the relationship between the financing source and the level of entrepreneurial activity in the country.

Secondly, as far as the financial issue is concerned, it is crucial to identify risk factors which rein back or, conversely, put forward the actions of an entrepreneur. The counterpart

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of this process is the investor's outlook whether to sponsor small business or not, which also stems from the observed risk environment.

Thirdly, after economic risk factors are cleared out the analysis of the revealed risk factors – their likelihoods and consequences should be applied. Additionally, with the help of estimation and evaluation techniques the risks need to be ranged according to their significance on the national level, forming an indicator of the possible economic downturn.

Lastly, in order to achieve the stated goal and to condense the information into a single number it is essential to combine the revealed indicators into a complex index. The sense of this result is to absorb both internal characteristics (i.e. motivation, company profile) of small business units, given their perception of economic risks, and external environment with its overall risk concentration.

In this way, evolution of the idea to regard the small business activity as an analytical tool for the risk determination in the economy is developed in the research background section. Subsequently, two approaches are suggested in the paper. The theoretical foundation is presented in the form of structural models in order to provide an economic reasoning for the proposed views. The empirical evidence is outlined in the second part of the paper based on the statistical models' results.

Keywords: entrepreneurship; credit risk; informal capital; GEM

1. Research background overview

In a growing stream of academic literature on the topic of small business activity and financial resources attraction the concern about entrepreneurial contribution to the growth and competitiveness is evident. Keeping this statement in mind, two explanations of the relationship between entrepreneurial growth and overall economic development are set forth in order to cover the first point marked out in the previous section.

1.1 Entrepreneurial activity and its influence on economic performance

On the one hand the dissemination of small firms in the economy triggers off an increase in production rates and output growth. For this reason the nature of such a relationship should be understood. One of the arguments lies in the conceptual framework elaborated by Paul Reynolds who managed to establish «a comprehensive assessment of the role of entrepreneurship in national economic growth» (Reynolds 2005).

On the other hand there is one more channel for the impact of entrepreneurial activity on the socioeconomic development – creation of additional workplaces. This theory runs smoothly in practice unlike the previous one. It is generally accepted that the rise in the number of employed people stimulates the production growth as well as individual welfare improvement in terms of higher income rates. Admittedly, the ability of small business firms to generate jobs is not constant under different

circumstances. According to these findings it turned out that an increase in the labour force does not always lead to the growth of afirm (North 1995). On the contrary, entrepreneurs in urban areas are likely to minimize the number of additional workers to achieve higher growth due to the better productivity rates.

Both of considered theories are in line with the attempt to explain the priority role of the small business activity. As far as this study is concerned it is crucial to evaluate the primary impetus, which gives rise to a new firm birth. Moreover, the main explicit step towards a start-up organization is initial investments into the business process. Hence the point of the interest is a firm at the early stage of its development. Additionally, the most acute issue concerns the incentives of an entrepreneur to launch business activity and to attract financial sources for this purpose. In this way the latter theory refers to a mature firm which is capable to generate additional jobs over an extended time period. Such a firm has overcome most impediments successfully and is not able to reflect the changing environment in terms of dealing with economic risks. By contrast the former theory allows catching the essence of the starting point and seems to be a clear support for the chosen macro view on micro decisions at the individual level.

To set the stage for the risk identification in the small business financing it is crucial to clarify the influence of financial opportunities on the business expansion. The financial strategy of an entrepreneur is no more significant (from the theoretical side) unless it has some economic reasoning, which generates special expectations, behaviour models, informal rules, affecting the entrepreneurship environment as a whole. And conversely, specific features of small business in some area can leave an imprint on the business strategic view, including the choice of financial capital. In the last sense, the dominance, or the permanency, or a regular combination of different financial sources can turn out to be the most adequate and appropriate indicator of the economy's soundness.

For an entrepreneur as for a single economic unit two ways of financing are available: own funds and a debt. However, the notion of the debt financing implies a vast range of unique alternatives in distinction to a corporate organization. Informal capital, as one of those peculiar options, can be posed between self-financing and debt-financing and also can be regarded as a two-fold problem of both financing and investment decisions.

The side of formal financial support is thoroughly investigated in the literature and taken into consideration by policy makers. The focus lies in the special legal, tax and information environment which enforces lending technologies through the supply of different types of credits. Until recently it has been considered that the small business financing through banking facilities is the most convenient and effective source. Nevertheless, the study of Thorsten Beck reflected upon the contentious issue about the positive role of banking sector «in enhancing economic growth through more efficient resource allocation» (Beck et al. 2004).

Informal capital investigations are in tune with the drive towards the growing demand for alternative financial sources due to the lack of available loan products. The prevailing form of informal investments is venture capital which is the subject of an acute interest for both researchers and policy makers. Such an investment source fills in the financial gap during the growth of a new firm. Anyway, there are some peculiarities connected with the consideration of venture capital. First and foremost, classic venture capital implies the allocation of financial funds among young entrepreneurial firms with a high growth potential (Mason, 2002, p.430), in other words, among technologically innovative small businesses. Thus a large portion of entrepreneurial activity is out of the focus, although it is equally important for the overall economic development.

According to C.M. Mason and R.T. Harrison classification (2002) informal venture capital market comprises, firstly, private individuals (so-called business angels), then direct forms of investment by non-financial companies (known as corporate venture capital) and, lastly, institutional venture capital (investments from pension funds, banks and insurance companies). All of these types shape the aggregate supply of informal funds which is not distributed evenly across the economy and therefore is seen by policymakers as a key instrument for the economic growth and employment enhancement.

On the hypothesis of the relationship between the financial choice of entrepreneurs and the development of entrepreneurial activity in the country it is remarkably, that each financial source alludes to both internal motivation and external environment. As a result the way of small business financing (either formal or informal) reflects the level of risk perception by an entrepreneur. In the aftermath of understanding the background of the financial choice it is necessary to disclose the assigned risk which underpins the economic behaviour of an entrepreneur. By managing the supply of financial funds (through the encouragement of various institutions) and by changing the surrounding conditions (political, social context) one is able to achieve risk mitigation in the economy.

The necessity for the risk investigation and its further measurement techniques are captured by the risk-management theory, which began to evolve from micro approach and has reached the macro-level view nowadays. The next step concerns reasons and analytical tools for the risk consideration and is presented in the following section.

1.2 Risk management outlook

In recent years all the sectors of the economy in highly-developed countries have focused on the management of risk as the only way to make an organization successful in increasing its economic value. To handle risk appropriately at the firm's level is the task within one business unit. Such «micro» approach is not consistent with the aim of this study in dealing with the incentives for start-ups.

Keeping in mind, that the opportunity to attract financial funds enables an entrepreneur to put the business into action, such features as credit risk, business risk and strategic risk should be embedded into the analysis in order to tackle the issue of capital attraction for start-up funding.

Credit risk evaluation based on the calculation of minimum capital requirements for credit risk was elaborated by Basel Committee on Banking Supervision and presented in the document called «International Convergence of Capital Measurement and Capital Standards». The main objective of the standards was to ensure the stability of financial system and prevent excessive risk-taking by financial institutions. To translate the goal into reality it is assumed that ex ante methods should be applied to prevent possible financial distress, since ex post systems seem to be delayed.

The main point perceived by the Basel Committee while accepting the Revised Framework in June 2006 was to enhance available provisions by means of more risk-sensitive capital requirements elaboration. This initiative was triggered off by the growing demand for the risk integration into the decision-making process not only at the single firm's level but also according to the needs of supervisory authorities.

The document "provides a range of options for determining the capital requirements for credit risk to allow banks and supervisors to select approaches that are most appropriate for their operations and their financial market infrastructure" (Basel Committee on Banking Supervision 2006).

The same view can be applied to the entrepreneurial activity consideration. It is no matter whether risk-management aspects are used by a single business unit, the more important issue is the ultimate outcome. If it is possible to determine how much financial risk is absorbed by the small business activity in the economy, then it is an appropriate indicator of the behavioural expectations and intentions among economic units.

2. Conceptual framework

In compliance with the risk management theory business risk refers to «uncertainty about the demand for products, the price that can be charged for those products or the cost of producing and delivering products» (Crouhy 2005). In relation to the beginning of the small business activity an entrepreneur faces the possibility of lower earnings than he has initially anticipated all along of changing market conditions. The effect of business risk determines whether it is possible to maintain the consistent performance during the early stage of a small firm.

One of the ways to eliminate presumable losses resulting from the business risk acceptance is the financial choice of an entrepreneur. Furthermore, negative

consequences stemmed from the uncertain event of worsening market conditions encompass either the waste of own investments or the liability to formal/informal creditor. For each of the mentioned alternatives special risk metrics can be assigned according to the risk criteria of associated costs and benefits:

Self-financing – the lowest risk level, individual savings is a risk exposure (the lowest capital price);

Informal capital – medium risk level, the liability to an investor who is ready to accept a large portion of credit risk due to the specific business nature (medium capital price);

Formal capital – demonstrates the highest risk level. The liability to a creditor whose strategy implies limited credit risk acceptance because of the external regulation and internal policy (the highest capital price).

As far as the investor is concerned there are two major types of economic risks: strategic risk and credit risk. «Strategic risk refers to the risk of significant investments for which there is a high uncertainty about success and profitability» (Crouhy 2005). This uncertainty is clearly illustrated by the decision making of business angels (private investors) as opposed to corporate venture capital. Since this kind of creditors calls the shots of the business, their investments are incorporated into the whole venture as well. Moreover, if a small firm without the growth potential is assumed the outcome is much vaguer.

On the part of the corporate venture capital and banking institutions credit risk is on the alert. Generally, it involves a shift in the credit quality of a borrower: not necessarily a default but also any reduction in expected returns on investment. What is more, the crucial interest lies in the field of potential exposure, in other words in case of default a bank (or a venture capital organization) will lose either the whole position or only a part of it if some amount of the loan is recovered (Crouhy 2005).

Credit institutions are supposed to participate in the business process under contractual conditions, thus the probability of losses is substantial for a concrete asset. That is why venture capital investors are seeking for innovative firms and banks prefer large companies that maintain the consistent profitability - it is the only way to limit the adverse consequences of taking credit risk.

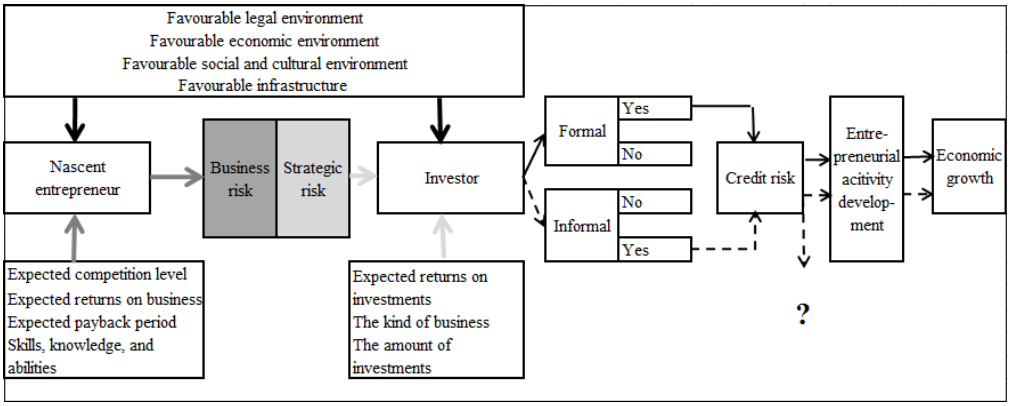
Following this idea it may be stated that at the stage of risk identification the strategic risk is more relevant with regard to private investors since they directly participate in the small business process, thus reducing possible adverse outcomes. Institutional and corporate venture capital as well as credit organizations tend to set bounds for the small business financing because of their inability to keep informed enough in order to assume more credit risk.

The snapshot of a conceptual model is presented in figure 1 below. An entrepreneur at the initial stage of the business development is influenced by both internal motives and external characteristics (Chepurenko 2007). The degree of these factors' perception determines the extent to the business risk acceptance. The outcome of this process is the financial choice of a nascent entrepreneur. At the

same time an investor encounters a risk of the unknown future returns, gained from the investments. As a result the model equilibrium is one of the two options: formal business financing or informal support.

If the formal credit is a dominant alternative, given the external environment and internal factors, then it speaks for the rational economic reasoning, based on the value maximisation by both sides (a borrower and a creditor) and leads to the economic growth encouragement. Although there is one exception: credit risk concentration. In case credit institutions assume excessive credit risk, neglecting due diligence procedures, that is a sign of the financial distress, as the whole mechanism has been damaged by wrong incentives.

Figure 1. Conceptual model: the interaction between nascent entrepreneurs and investors given the financial risk environment



Source: own creation

The choice in favour of informal funds characterises two events: either a favourable outcome or a negative effect, depending on the same issue – credit risk concentration. Moreover, high credit risk indicators can be regarded as inadmissible by formal credit institutions, thus passing them over to informal investors who are forced to take this excessive risk at their own account. If this portion of risk purports the ineffectiveness of the business implied, then it can turn out to be irrecoverable losses for the economy. And vice versa, if this excessive risk is accepted by informal investors because of the immaturity of the financial system then it is a single way to realise business opportunities.

Eventually, an entrepreneur will perceive the worsening conditions for the business differently, depending on the kind of the financial source attracted. In this way, it is necessary to set a range of specified parameters in order to estimate three kinds if financial risks in the economy mentioned above: business risk, strategic risk and credit risk.

According to Risk Management Standard elaborated by Federation of European Risk Management Associations the internal risk management process consists of three major blocks: risk assessment, risk treatment and risk monitoring (2003). To transmit the idea of the study down the line it is proposed to modify micro approach into macro one, preserving main principles and techniques.

The starting point is risk assessment, which comprises a series of stages following one after another. The first step is risk identification and subsequently risk description. The scope of risk encompasses events, which initiate the realization of adverse outcomes. The significance of the consequences for a person or an organization concerned is boiled down to risk tolerance. High level of tolerance indicates a sustained response of an entrepreneur to the changing environment, in other words his readiness to assume much risk until circumstances alter substantially. As it was mentioned before, private investors (as well as venture capital providers) prefer firms with high-growth potential. Whilst banks (and other direct financial institutions) more often reject in small business financing due to uncertainty and a danger of credit risk concentration.

Risk appetite implies the quantification of risk tolerance and includes three main parameters: possible losses, price of risk and risk control. The last item is embedded into the financial choice of an entrepreneur in case of business risk. As far as strategic and credit risk are concerned there are two possible explanations. Firstly, private informal investor is a direct participant in a small business process, so he is able to monitor the allocation of financial resources. In its turn banks establish comprehensive scoring systems in their business processes in order to track outstanding positions. Secondly, if the scope of risk is not confined to the risk appetite a creditor has an opportunity either to accept an excessive risk exposure or to refrain from the small business financing.

Table 1. Credit risk evaluation in compliance with Basel II IRB advanced approach

Basel II risk elements	**Adjusted indicator**	**Definition**
PD (Probability of default)	Probability of stopping business activity (ex post)	The share of entrepreneurs, who shut down business
	Probability of default among nascent entrepreneurs (ex ante)	The estimated share of entrepreneurs, who will possibly shut down business
LGD (loss given default)	The share of losses in the total sum invested into small business activity	The estimation of the expected returns on business by nascent entrepreneurs, which are less or equal to the 100%.
EAD (exposure at default)	The outstanding sum of money invested by any investor	The amount of money (as a part of the total sum of the start-up capital) attracted in the form of a loan

Source: own creation

Credit risk analysis stems from the requirements, assumptions and techniques in the framework of the advanced Internal Ratings-Based approach suggested by Basel Committee. The approach relies on the special metrics which provides a way for further capital calculations to cover bank's credit risk (Basel, 2006, p.52). In terms of this study a parallel shift of proposed metrics is implied, keeping all the requirements unchanged at the same time. Thus there is an opportunity to receive an intricate and interconnected system of indicators that captures all the credit risk parameters where both internal and external characteristics are embodied.

The correspondence between indicators calculated according to the Basel methodology and those that are appropriate for the current research is presented in the table 1 above.

3. Database description

The following study is a part of the international project Global Entrepreneurship Monitor (GEM), aimed at the investigation of entrepreneurial activity in the world. The Russian team's participation in the project made possible to carry out several researches concerning small business development in Russian Federation (2006-2008) and to analyze world-wide tendencies for the year 2006.

The opportunities of GEM data compared with the scope of official statistics allow to capture a deeper field of entrepreneurs' and their sponsors' internal

incentives. The example of Russia, as well as other countries, where the statistics is based on the United Nations Organization concept, enables researchers to investigate small and medium size enterprises only after 2 years have passed since their official registration.

The strength of GEM lies in the opportunity to categorize the group of potential entrepreneurs (the stage before the official registration) and nascent entrepreneurs (the stage just after registration and further for 3 months functioning).

The time period of the survey concerns the dataset for 2006 with indicators harmonized and standardized for comparisons in 42 countries – GEM project participants that year.

The object of the study is a group of nascent entrepreneurs marked out in accordance with the accepted classification of GEM methodology. These are people aged between 18 and 64, actively involved in managing a business which they already own solely or jointly, but who have not had any income from the business at all, or have only been receiving it for no more than 3 consecutive months.

According to the GEM methodology formal resources include capital in the form of banking credit or in the form of the financial governmental support. The GEM methodology also makes it possible to factor in various sources of financial resources, including the funds of business angels and love capital. The category of "love capital" (money from relatives, friends, neighbours, work colleagues) differs from the business-angels' investments (third parties who invested their own funds into detached business activity). Although both categories are combined into a group of informal investors: people who have personally provided funds for start-ups of others in the last 3 years.

The methodology used to check the stated hypotheses includes firstly a full descriptive analysis in order to reveal definite tendencies and to form expectations from the research and its possibilities. The regression analysis was applied for the model construction. Factor and variation analyses were used in dealing with the factors identification, influencing the financial behaviour of an entrepreneur.

4. Empirical evidence

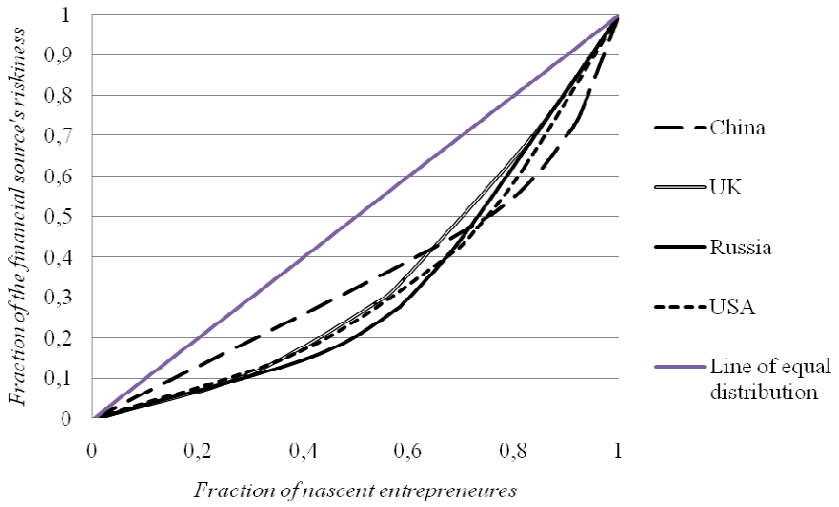
4.1 Business risk evaluation

As far as a small nascent firm is concerned, business risk is an inevitable element in the entrepreneurial performance. This kind of risk implies possible losses which can be regarded as a worse financial result compared to what has been initially expected. To mitigate the consequences of this risk acceptance an entrepreneur manages his financial choice by putting together costs of financial capital and expected losses in case of an adverse outcome. The results are a debt to a bank, a liability to an informal investor or a waste of the own funds.

In this way, taking into the account the entrepreneur's expectations about future changes in the economy the exact financial source will be demanded. External financial sources (which are available in the GEM database) were ranged according to their business risk reflection for the purpose of the further analysis (based on the special risk metrics, introduced earlier).

The graph below (fig. 2) shows the risk distribution among nascent entrepreneurs in several economies. This illustrative example covers 4 countries from different parts of the world with different economic development: China – the Eastern part of the World, Great Britain – a European representative, the USA – a separate continent, and Russia – a transitional economy. Remarkably, all of these countries represent different business risk performance. For Russia the concentration of the "safe" capital is obvious – more than a half of all nascent entrepreneurs attract "biased" capital for the business financing. As for the UK and the USA the same distribution is performed in regard to informal funds, and then an obvious distinction is observed: the demand for formal capital among English entrepreneurs is higher than among American ones.

Figure 2. The distribution of financial sources among nascent entrepreneurs: a differentiation of the riskiness



Source: own creation

The perception of the business risk by nascent entrepreneurs depends on the environment appraisal and internal motives (Sternberg 2005). To clear out the connection between the choice of a financial source (as an indirect characteristic of the business risk tolerance) and some factor variables a nonparametric test was used.

The following indicators were analyzed in the ordinal scale in order to ensure comparability and consistency of the results.

1. *Market conditions* – the estimation of the opportunities' availability in the market for a business launch.
2. *Skills and knowledge* – the internal parameters which drive the entrepreneurial behaviour, justifying his motivation.
3. *Payback amount* – the estimation of the business' future profitability, which characterises the potential of the chosen activity from the entrepreneur's point of view.
4. *Start-up capital* – the scope of the business: designates the welfare of an entrepreneur and his confidence in the success.

The ability to use the nonparametric Kendall-Smith test in order to assess the contingence between two variables in the ordinal scale is justified. The verification of the same distribution of all indicators was achieved: the right-sided asymmetry is confirmed at the 5% significance level.

The most crucial results are presented in the table 2 below (the results for other considered countries did not represent statistically significant values). The most crucial ones were achieved in 5 economies among 42 countries. Market conditions are essential for nascent entrepreneurs in Russia and the Netherlands. That is the degree of business risk taken is the reflection of the economic soundness. Entrepreneurs' skills and knowledge influence the financial choice in Ireland and the Netherlands. In all the considered countries the start-up sum is not significant in terms of the business risk assessment. As far as a payback amount is concerned it is of a substantial importance for nascent entrepreneurs from all these 5 countries.

Table 2. The contingence estimation between the financial choice of nascent entrepreneurs and various motivation factors, based on the Kendall-Smith nonparametric test (with a significance level in brackets)

Country	*Market conditions*	*Skills and knowledge*	*Start-up capital*	*Payback amount*
Iceland	0,129 (0,214)	0,063 (0,434)	0,138 (0,24)	0,889 (0,014)
Ireland	0,165 (0,204)	0,272 (0,02)	0,104 (0,439)	0,577 (0,014)
Netherlands	0,407 (0,066)	0,216 (0,29)	0,078 (0,684)	-*
Russia	0,426 (0,872)	0,039 (0,868)	0,115 (0,5)	-*
Great Britain	0,01 (0,872)	0,033 (0,592)	0,182 (0,01)	0,202 (0,152)

*- there are not enough observations for the analysis

Source: own creation

According to these scattered results it turned out that a set of the distinguished business risk parameters was a quite indefinite entrepreneurial characteristic for the

statistical use, which could not be aggregated to cover all economies. However, it is a useful element for the financial choice interpretation. For example, in Great Britain there are two extremes: formal credit business financing and informal support. Amazingly, but neither perceived market conditions nor entrepreneur's skills and knowledge explain this fact. Nevertheless, a payback amount influences the financial choice, so that, supposedly, more confident entrepreneurs are ready to take banking credit. The thing is that almost one quarter of nascent businesses are supported by the banks' products – the indicator of high risk tolerance of British entrepreneurs because of the low cost of the business risk.

The opposite situation is in Russia: more than a half of nascent entrepreneurs are going to attract informal funds under the influence of market conditions. Low risk tolerance is explained by the high cost of the business risk taken (immaturity of financial system, difficult access to the credit funds and others).

4.2 Strategic risk evaluation

The scope of the strategic risk refers to the downgrade of the returns on investments or to the lack of those returns, or to the total loss of the invested funds. This kind of risk is thoroughly mitigated by credit institutions with the help of the developed scoring systems and elaborated selective process. However, informal investors are not secured from the strategic risk consequences for two reasons. Firstly, because of the risk appetite ignorance and secondly, owing to the residual principle in the small business financing after the refusal of credit institutions.

In both cases informal investments can be regarded as an indicator of the economic situation in the country, although it is not clear if there is a rational reasoning for the strategic risk acceptance: either it is accepted without being identified or it is involuntarily taken.

In order to develop this view on the strategic risk, a widespread attraction of informal funds and, more precisely, the love capital support should be corroborated by the theoretical evidence. The key interest lies in the following: is the informal investment a complementary or additional source for small business' financing, and what are the consequences in both cases, what does it mean for the future development of the entrepreneurial activity and for the economy's evolvement as a whole?

To answer these questions a model was constructed. The parameters were specified up to the quadratic regression model, where all the coefficients are significant at the 5% level. The model views as follow:

$$Y=a+b\cdot X+c\cdot X2+\varepsilon$$

The independent variable is an indicator of the social and economic development (GDP per capita in real prices, USD) (World Bank 2006) and the dependent variable is a level of SME start-ups' informal funding (the proportion of

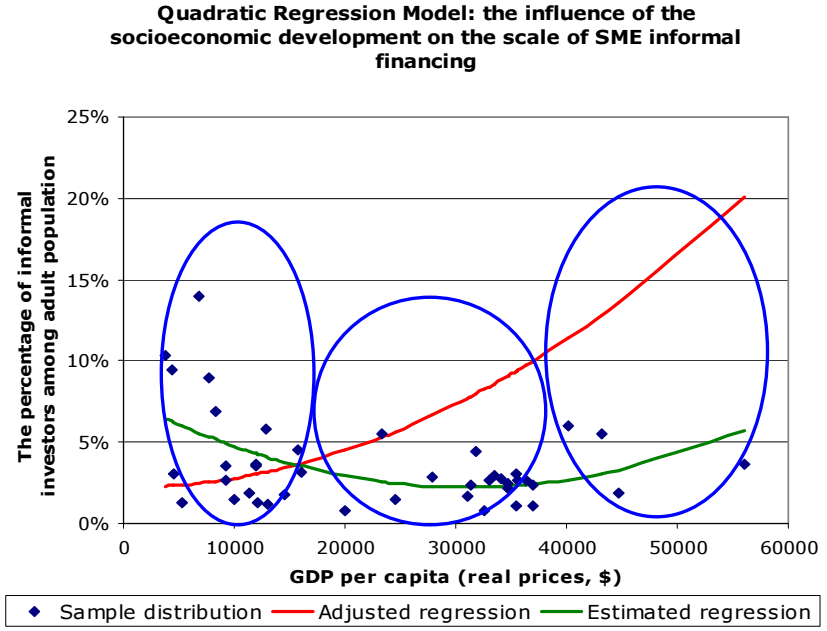
informal investors among the adult population). After the specific procedure (Weighted Least Squares method) an adjusted model was received with the maximum validity achieved (fig. 3).

Countries such as Slovenia, India, China, Brazil, Russia, Latvia, where the level of social and economic development can be said to be low or medium, have typically a large share of informal investments.

Germany, Finland, Czech Republic, Hungary, Denmark, Canada, Japan, Austria, Belgium, France, UK, Sweden on the other hand, have a very small percentage of informal investors, hardly 3% of employable adult population who invest enormous sums (providing the predominance of informal capital), though a level of the population's prosperity is sufficiently high.

And lastly, the USA, Norway, Iceland and Ireland formed the third group, where both socio-economic development and informal investments tend to be higher than average.

Figure 3. Dependence between social-economic development and the scale of informal investments for the 2006



Source: own creation

The constructed model represents the dependence between a level of socio-economic development and small business informal financing. It allows revealing the potential threat to the entrepreneurial activity by means of the excessive informal

support. In other words, identifying the place of a particular country in the parabola one can assess the role of informal capital in SME financing: whether it is a desirable way of funding or unnecessary source.

Therefore, the first group of countries demonstrates high levels of informal funding as the only possible way to promote business activities because there is no other possibility to set up an optimal infrastructure (Saemundsson 2003). At this stage the strategic risk is taken forcedly and reflects its inevitable role in the small business financing.

The second group of countries is in «balance»: a low fraction of informal investors is recognised due to the availability of alternative mechanisms for the distribution of the financial capital among entrepreneurs, which props the high level of prosperity. Possibly, informal investors are not aware of the strategic risk, thus their risk tolerance does not matter and the risk price is not efficient one.

As far as the third group is concerned the role of informal investments as well as the scope of strategic risk is not defined properly. The availability of spare financial resources and high expected returns on investments are able to encourage strategic risk acceptance and to enforce informal investments. At the same time, biased relations with borrower can trigger off the underestimation of risk factors and lead to the excessive risk taking. However, the strategic risk concentration is no more harmful for the economy until it is perceived by informal investors as their voluntarily deposits of available financial resources into the business activity. The occurrence of losses will correct the situation – inefficient investments will not be repeated.

The consideration of the business risk is reined back by their either biased or forced nature, which is difficult to fetch out from the available dataset. The strategic risk tolerance gives a chance to explain the economic development only for a part of the nations, keeping uncovered highly developed countries with a large portion of the informal support.

5. Credit risk evaluation: a leading indicator of the economic downfall construction

Unlike business and strategic risks credit risk arises after the funds have been invested, thus causing unexpected losses because of the downgrade of the creditor's quality. Both formal and informal investors encounter this kind of risk to a different degree irrespectively whether they are "morally biased" to provide funds or not. Over the last decade a lot of banking organisations tried to model credit risk – as a main source of unforeseen troubles.

Basel Committee on Banking Supervision elaborated a range of minimum requirements and a compulsory system of indicators for the credit risk evaluation in

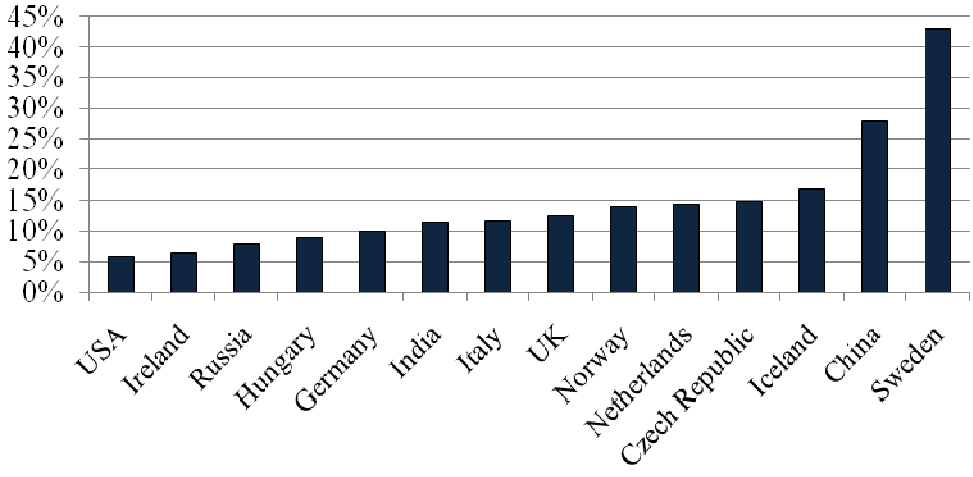
order to calculate the amount of the financial capital needed for a bank to cover unexpected losses.

To conduct a preliminary credit risk assessment not all the countries were investigated. The USA, Ireland, Iceland and Norway were included into the analysis because of their ambiguous position in the World scale (it was cleared out after the strategic risk estimation). Russia, India and China were taken into the account as the largest representatives of the first group, distinguished in the previous analysis. The UK, Sweden, Italy, Germany, Hungary, the Netherlands and Czech Republic were considered to be differing by their location and history European countries.

Firstly, the probability of default was estimated based on the sample number of defaulted entrepreneurs. Factors, influencing the intention to shut down business activity were distinguished with the help of discriminatory analysis (Engelmann 2006). Then these factors were used in the regression model construction in order to determine the probability of default among nascent entrepreneurs. For each investigated country a specific set of significant variables was selected (at the 5% level of significance according to the Fisher criterion).

Among such ex ante factors, which presumably have an impact on the intention to stop business activity, as age, gender, knowledge and skills, market conditions perceptions, skills and knowledge are prevailing in all the considered economies. Only in the UK age and gender turned out to be relevant whereas the rest of the indicators did not demonstrate a statistical significance.

Figure 4. The probability of default estimation among nascent entrepreneurs: low bound



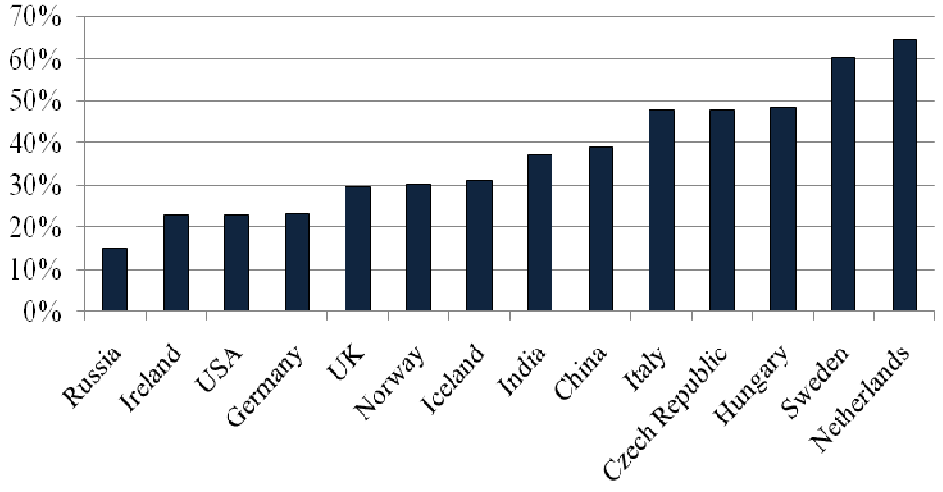
Source: own creation

After the selected factors were applied, the probability of default estimation among nascent entrepreneurs had been received. A range of countries by the estimated probability of default is presented in the fig. 4. Remarkably, the countries where the highest demand for the informal funds is observed (Sweden, China, and Iceland) demonstrate the highest instability of the business activity. Moreover, this result was achieved without taking into the consideration any indicators concerning the choice of financial sources. In this way, the survivability of small business depends not only on the internal perceptions of an entrepreneur but also on the external environment assessment.

The indicator of Loss Given Default was calculated based on the expected returns on the business activity by nascent entrepreneurs as a mathematical expectation of the business profitability. The results can be found in the fig. 5. The main tendency remains stable: countries with unstable business activity are characterised by the highest level of expected losses in the total amount of the borrowed capital. Moreover, these indicators are not interconnected, so the result can be regarded as being confident.

The case of Russia justifies the previous findings concerning an inevitable need for informal resources when the financial system is immature and does not ensure sufficient capital funds. This is the reason for the stable business activity and insignificant losses at the initial stage. Such countries as Czech Republic, Norway, and the Netherlands are at the edge of the stable entrepreneurial activity: a considerable share of expected losses is able to instigate further variability.

Figure 5. Loss given default estimation among nascent entrepreneurs: low bound



Source: own creation

As far as Exposure at Default is concerned, it was estimated as a share of the borrowed capital given the risk concentration (measured according to the Herfindahl-Hirshman index) in this sum. Among all the countries there is a significant (at the 5% significance level) relationship between the financial source chosen and the start-up sum needed to launch a business according to the nonparametric Spearman correlation criterion. Keeping this fact in mind the assumption about the riskiness of the concrete financial source was integrated into the analysis. The concentration of the sources bearing a high risk (that is banking credits and governmental support) in the economy identifies a risky nature of the borrowed capital. The more risky the invested capital is the more considerable the exposure at risk should be, and the more unstable environment is observed in the economy.

Summing up, an indicator of the exposure at risk is received by means of multiplying the total borrowed sum by the concentration coefficient (Gini ratio) of the risk in the economy (based on the financial structure).

In order to construct an ultimate indicator which absorbs all credit risk in the economy connected with the entrepreneurial activity numerically, the following formula should be applied:

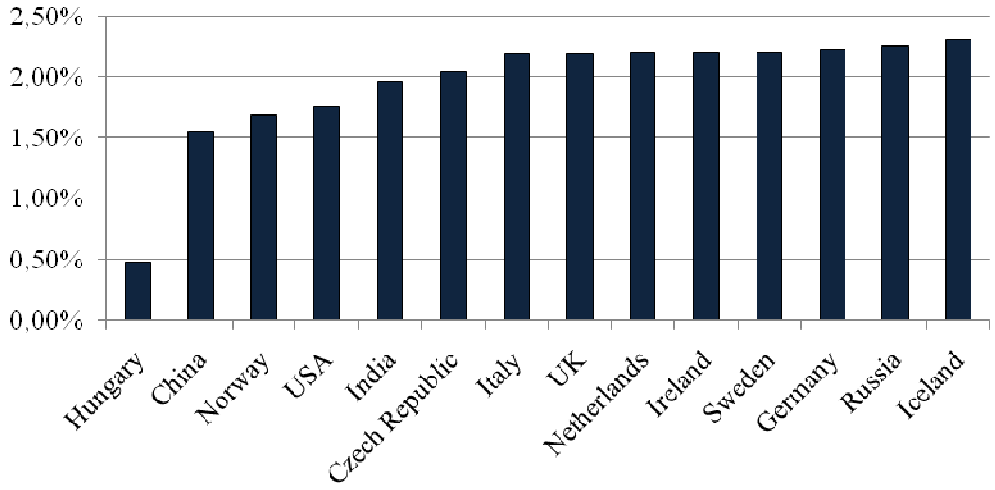
EL = PD*LGD*EAD EL – expected losses in the economy

PD – probability of default

EAD – exposure at default

Taking into the account the scale effect, the received indicator should be adjusted to the size of the country in terms of the GDP volume.

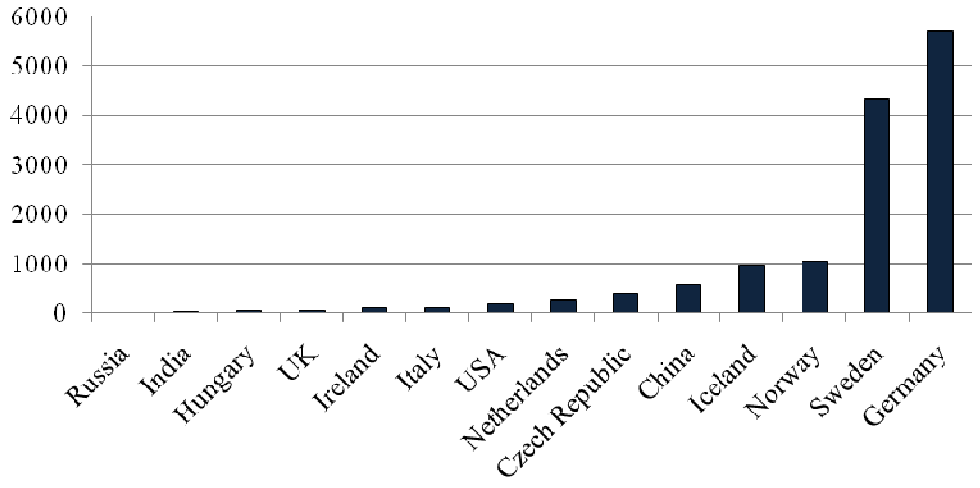
Figure 6. The estimation of the expected economic losses from the entrepreneurial activity in the total amount of GDP (PPP): upper bound



Source: own creation

Further calculations are based on the adjustment of expected losses to the single currency in order to relate the received amount to the total GDP rate, expressed in the USD (PPP). It is possible to get comparable values by finding the proportion between the GDP volume in the national currency and the GDP rate in the PPP (issued by the World Bank community) and applying these proportions to the amount of losses, received in the national currency for each country. Thus, the Global Default Index has been constructed. It shows the maximum share of the Gross Domestic Product needed to cover risks caused by the entrepreneurial activity in order to make the economy more sustainable to the systematic fluctuations. Fig. 6 throws light on the fact that in some European countries with a highly developed economies expected losses (or an entrepreneurial burden on the economy) are significantly higher than in some transition nations: India and China. As for the UK and the USA, due to their stable business financial structure (low PD and LGD indicators) the perception of the risky environment by nascent entrepreneurs softens the adverse consequences of the excessive risk taking. No more that 0.5% of the GDP is needed for Hungary to ensure a safety "cushion" and no more than 2.3% of its GDP is essential for Iceland to keep the economy afloat. Thus, a combination of financial sources determines whether the economy is able to stand against possible financial distress or not.

Figure 7. The estimation of the expected economic loss caused by the entrepreneurial activity per nascent entrepreneur (thousands, USD): low bound



Source: own creation

The other indicator provides more distinct economic sense for further interpretations in terms of numeric and dimension value (see fig. 7). Notably, estimations are provided given the percentage of nascent entrepreneurs among the adult population. A low bound of the confidence interval is taken with the significance level of 5%.

The presented indicator reveals potential losses among nascent entrepreneurs if they go bankrupt at the same point of time. Moreover, it can be interpreted as the mean level of losses among nascent entrepreneurs, which can be also regarded as a global indicator of default, because it comprises both default rates (riskiness of the financial source, internal entrepreneurial motivation) and the level of the economic development. Additionally, it is suitable for international comparisons and ranking. Furthermore, an economic interpretation is possible as well as the measurement of the problem's depth is available. In other words, the mean level of losses reflects the sensitivity of the economy to the losses occurred in the small business performance. Remembering the idea that small business units are the most mobile and vulnerable economic structures, greater sensitivity means quicker response to the subsequent deterioration of the economic situation.

In Russia the expected loss per nascent entrepreneur is not less than 54 thousands dollars to the accuracy of 95% and it is the minimum amount among the considered countries, obviously due to the low level of the early entrepreneurial activity. The expected loss in Germany is not less than 7 million dollars, in the USA – 228 thousands dollars (at the significance level of 5%). These figures disclose the risk concentrated in the economy where small business is functioning. The correspondence between the micro level analysis and the macro view on the problem can be drawn: as in the case of a bank that has to keep enough capital to cover risks arising from its credit affairs, the economy should guarantee that at least 2.25% of GDP can be released to support small business activity in Russia, Germany and so on.

In conclusion, if the economy is quite sensitive to small business fluctuations and nascent entrepreneurs respond to the environmental changes in a swift manner, it can be regarded as a sign of the possible deterioration of the economic performance, expressed as economic downturn conditions. Financial choice of nascent entrepreneurs is a kind of a hedging strategy in terms of the perceived unfavourable circumstances. Unavailability of formal financial sources can be viewed as a reflection of the risky environment and excessive risk concentration in informal funds, which do not require tough screening procedures when providing nascent entrepreneurs with financial capital.

Table 3. Summary of results: risk concentration vs. financial choice of nascent entrepreneurs

	Overall risk level in the economy			
Small business financial choice		***Low***	***Medium***	***High***
	Self-financing	Stable (UK, India)	Stable (Netherlands)	Economic downturn (Germany)
	Informal capital	Economic upturn (Russia, Hungary, Ireland)	Ambiguous (China, USA)	Economic downturn (Iceland, Sweden)
	Formal capital	Economic upturn (Italy)	Stable (Czech Republic)	Volatile situation (Norway)

Source: own creation

According to the research results all outcomes can be divided into 6 groups with a breakdown into 2 axes: financial source and the overall risk level in the economy (see table 3). Pursuant to the mean level of losses among nascent entrepreneurs it is possible to cluster the considered countries into 3 categories: low risk group, medium risk group and high risk group. The sense of the clusterisation is the following: the more capital is needed to cover the risk, caused by the entrepreneurial activity, the more risky environment is, and vice versa.

Remarkably, but a stable situation in terms of the entrepreneurial activity development along with anticipated economic stability is observed in India and the UK (low risk and self-financing). The Netherlands represent a benign picture of the small business favourable influence on the economic welfare (medium risk level and self-financing). Entrepreneurial activity gains momentum in Hungary, Ireland and Russia (informal capital and low risk performance). Italy demonstrates sound financial system whereas China depicts volatile situation (medium risk level along with the informal capital concentration).

These results are especially crucial given the interest to the ongoing crisis development. The "credit crunch" began in the USA in 2006, when the excessive risk concentration in the banking sector became apparent (Reinhart 2008). Meanwhile, the probability of default among nascent entrepreneurs was the lowest that year (see figure 7), as well as the loss given default rate. It is not surprisingly, as it was quite easy to get financial support to launch business activity, possibly, in order to cover increasing liabilities. However, the Global Default Index along with the mean level of losses reined back the optimistic expectations. The amount of capital that was equal to no more than 1.7% of the American GDP was needed to

offset the risk in the economy. An increase in the two last indicators' values, compared to the low level of PD and LGD rates, is explained by the magnified EAD factor. The growth of this indicator was connected either with a rebound of the borrowing rates among nascent entrepreneurs or with an increase in the capital required to launch business activity. More detailed analysis revealed that exactly the former hypothesis was not rejected: entrepreneurs became more cautious and refrained from excessive self-financing by leaving more savings for the future. That is the reason for the USA to be in the medium risk cluster, which gave grounds for the economic downturn forecasting.

6. Conclusions and implications

Thus, it was considered that by choosing a source of financing at the initial stage of development, entrepreneurial activity shaped the general economic environment. On the whole the fundamental idea of the study throws light on the fact that each small business entity is making decisions under the influence of both environmental changes and own motivation how to organise the process. After individual risk profiles were marked out they were aggregated into a single indicator which reflected risk concentration in the economy according to the actions of the primary risk bearers – entrepreneurs.

Therefore special techniques were adopted from the risk management practice, which is thoroughly developed in the corporate sector. In compliance with a standard methodology possible risks were identified and described as well as analytical tools were suggested for their assessment. The concrete metrics was specified for the indicators construction with a preliminary empirical validation.

To identify whether an economy is susceptible to the worsening outcomes or not it is useful to embark on the risk consideration caused by the entrepreneurial activity. These findings are crucial at the macro level when identifying gaps in the economic functioning and seeking for levers to manage the economic system.

Moreover, the ongoing research is a kind of support for credit organisations which are going to implement IRB advanced approach under the Basel II Framework. The assistance in the PD, EAD, and LGD estimation implies a range of internal factors and external characteristics selection which should be taken into consideration during the forecasts construction. In order to detect shortcomings in the modelling tools, GEM data opportunities come as an appendix to the internal parameters elaboration at the micro level within a single bank. The presented macro characteristics can be regarded as stressed estimators of the borrowers' default, depending on the overall surrounding conditions. Further specification based on the internal banking procedures will enable bank managers to assess credit risk more properly.

Small business is the most flexible and mobile economic structure, at the same time it is the most fragile and susceptible to the external fluctuations one. It is necessary to capture both the inner side of a small business activity and the outer impact on its perceptions in order to imprint the economic situation. It will give an opportunity to reveal certain movements in the process, thus controlling tendencies in the behavour of small business as a beacon for the economic pitfalls.

There are some restrictions and perspectives for the study. First of all, it is a sampled analysis only for a one time period (2006). Dealing with statistical estimators one should be accurate, moreover, the revealed interconnections might have changed through the time – so additional analysis for other time periods is anticipated to check the stability of tendencies. To use multiple regression methods a wider sample is needed to achieve the most appropriate results. The solution will be incarnated when international bases for 2007 and 2008 are available for their combining and expanding the number of observations. The study lacks the detailed environmental analysis of the chosen countries – their legal, political, economic and socio-cultural context. Such materials could enlarge the range of possible hypotheses; nevertheless the mentioned data should be harmonized with GEM data-set to receive correct and comparable results – that is the question of future research. And of course there are inevitable obstacles connected with the nature of data collection: longitudinal research implies the invariability of the questionnaire through the years even if the necessity in more correct and precise information is needed. To compare results among different countries the standardized methods are applied, although each nation is unique in its development and requires different research approaches.

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