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Investment Risk in Branches of the Kyrgyz Economy

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Introduction

In 1992 Kyrgyzstan was among few Central Asian countries that initiated the process of intensive systemic transformation based on, in general terms, a transition to a market economy and involved economic liberalization and the implementation of institutional changes including the privatization of the state - owned sector. In subsequent years similar reforms - although often with different structure and scope - were launched in the remaining countries of the region.

After the first few years of intensive and widespread economic reforms, Kyrgyzstan began to attract the attention of foreign investors. In the period 1992-1997 the total flow of foreign investment in Kyrgyz Republic reached the level of 644.7 million US dollars, and became a dominated form of the investment activities. It has been recognized that foreign investment promotes the restructuring of industry and ensures the integration of the national economy into the word economy. Moreover, it stimulates economic growth and development, providing economies in transition not only with financial resources but also with new technologies, better management techniques and access to international markets. Therefore, the desire to attract foreign investors became one of the main driving forces of the reform process in Kyrgyzstan and in all transition economies.

The main part of foreign investment in Kyrgyz Republic in the period 1972-1997 concentrated on the development of the *Kumtor* gold mine (the share of *Kumtor* in the total foreign investment in Kyrgyzstan in the period 1992-1997 was about 80%). Unfortunately, apart from the Kumtor project, foreign investors have shown only very limited interest in the Kyrgyz Republic relative to that shown to some other countries of the region. Nevertheless, foreigners invested to oil industry, tobacco industry, sugar industry, soft drinks production and milk processing. In regional context foreign investment concentrated mainly in Issyk-Kul region (where the gold mine *Kumtor* is located). The importance of *Kumtor* for the development of the region is enormous (in 1997 84.7% of total production of the region came from *Kumtor*). In Chuy region 52% of total production comes from the joint-venture enterprise *Bakay*. In Djalal-Abad region the share of another joint-venture firm *Kyrgyz-Petroleum Kompani* in total production of the region reached 73.1% in 1997. In Bishkek, the capital of the country, the significant part of regional output is produced by such international or joint-venture firms as,

Coca-Cola (*Кока – Кола*, soft drinks industry), *Bakay* (*Бакай*, sugar industry), *Kitlap* (*Китлап*, food industry), *Chuy-glass* (*Чуй – Гласс*, glass packages), *Bakay-suu* (*Бакай – суу*, mineral water production), *Eridan* (*Эридан – сут*, milk processing industry), *Simex* (*Симекс*, furniture industry), *Icekvin* (*Айсквин*, ice-cream production). Till the date very small foreign investment flow (22.6 million USD) has been observed in Osh region (in this region lives 32% of the population of the Kyrgyz Republic, but it has to compete for foreign investments with relatively well industrialized neighbor region – Fergana Valley in Uzbekistan).

Most of foreign investment in Kyrgyzstan goes to the industry, however, the share of foreign or join-venture firms in the industry does not exceed 25% of the total number of firms with foreign capital (46% of such, usually very small, enterprises concentrate in trade and in restaurants, cafes, hotels).

At the end of 1997 about 19700 employees[1] (1.2% of total number of employees) worked in enterprises with a joint (Kyrgyz and foreign) capital. In 1997 an average monthly salary in these enterprises was about 4 times higher than an average salary in Kyrgyzstan.

Foreign and joint-venture firms produced in 1997 about 10.5% of GDP of the Kyrgyz Republic (practically, 100% of Kyrgyz production of such goods as sugar, fuel, diesel oil, computers (assembling), glass packages, tea, and salt, is produced in enterprises with foreign capital). Moreover, 78.5% of macaroni and noodles, 53.2% of jewelry and related articles, 53.2% of soft drinks, 52.8% of textile production is produced in such firms as well.

In 1997 foreign and joint-venture firms exported goods for more than 104.6 million US dollars (17.3% of the total export of the Kyrgyz Republic). It should be mentioned, however, that data above do not include the export of gold which is organized by Kyrgyz firm. Value of the gold – produced in join Kyrgyz-Canadian firm but exported by Kyrgyz firms – consists about 160 million US dollars (25% of the total export of the Kyrgyz Republic).

To summarize: the scale of the foreign investment in the Kyrgyz Republic (excluding *Kumtor*) is relatively small, but the data presented above show that this is a vital factor for the economic development.

[1] This number includes about 1000 foreigners working in Kyrgyzstan.

Very limited interest of foreign investors in the Kyrgyz Republic (138 US dollars per capita, and except of *Kumtor* – only 27 US dollars) follows from limited attractiveness of Kyrgyzstan which does not have, unlike the neighbor countries, almost any natural resources (gold is an exception). Small market (4.7 millions of inhabitants), low income (in 1997 an average salary was equal approximately 35 US dollars), and underdeveloped communication and telecommunication infrastructure do not bring in foreign investors. Moreover, post-soviet bureaucracy, corruption, and underdeveloped financial sector harm the investment and development of the private sector as well.

It should be stressed that to attract domestic and foreign investors, some major steps have been accomplished in improving the legal and regulatory framework. Some key business laws, such as the law on pledges and the procurement law, has been enacted. However, in several critical areas, there are still some inconsistencies that harm investors (in order to be fully conducive to private sector development and foreign investment, more stability and predictability is still required in the legal and regulatory framework so as to prevent ad hoc changes of laws and regulations by government or parliament). Moreover, to attract foreign investors the business information system has to be developed in the Kyrgyz Republic. The risk, naturally associated with any investment, can be reduced only if information about the main risk factors in the market (as complete as possible) is used in the investment decisions. Note, that it does not mean that the development of the business information system about investment risk will guarantee immediate inflow of foreign investment, but it will allow appropriate evaluation of the investment risk which affects all investment decisions. Better knowledge of the level of investment risk will surely support investment and attract foreign capital.

The following study is focused on investment risk in particular branches of the Kyrgyz economy, i.e. in groups of enterprises providing the same or similar goods or services. The research involves construction of a composite scale on which branches are placed in an order of declining investment risk. Chapter 1 introduces factors determining the level of investment risk in branches. Chapter 2 presents the methodology of research, while Chapter 3 contains a description of the results of analyses of investment risk in branches of the Kyrgyz economy in 1997. The study concludes with pointing out the possible applications of its results.

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1. Branch investment risk and its indicators

Investment risk is defined in this study as the potential degree of threat to achieving economic results expected by the investor. The higher the investment risk, the lower the probability of achieving favorable economic results. This results from the conviction that any concept is a combination of phenomena rather than a simple, directly observable phenomenon[2]. Such a situation is also the case with the branch investment risk.

The branch investment risk is composed of three basic aspects: the efficiency-related, structural and systemic one[3].

Factors directly dependent on the efficiency of operation of branches are reflected by the efficiency-related aspect. This aspect can be divided into three dimensions representing profitability, liquidity and pace of development.

The structural aspect reflects the risk factors specific of a given branch and resulting from the specific features of the conducted activity. Entities of a given branch have only limited chances of influencing this part of the risk, although they are not totally deprived of these chances. For example, entities operating in energy- and material-intensive branches can employ more energy- and material-saving technologies, and this way exert their impact on the risk level. In this aspect, we can talk about risks involved with the specificity of the process of production (technology risks), and risks involved with the economic potential of a branch.

The third and final aspect - the systemic one - is the reflection of risk factors in a branch, resulting from the branch position in the economic system of the state and in the world economy. In this case, the risk is least dependent on the branch itself, as the government of the Kyrgyz Republic and international factors are its main creators.

The economic risk, in its part described by profitability is characterized by the following indicators:

- *gross profitability* - being the ratio of gross financial result to total revenues of a branch;

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2 Rutkowski J., *Rozwój gospodarczy i poziom ¿ycia*, GUS, Warsaw 1984, p. 89.

3 Instytut Badañ nad Gospodark¹ Rynkow¹, *Mapa ryzyka inwestycyjnego w bran¿ach polskiej gospodarki*, Warsaw 1997, p. 7.

- *net profitability* - being the ratio of net financial result to total revenues of a branch. Positive values of profitability indicators point to positive financial results achieved by enterprises of the branch, being the key criterion for credit risk evaluation.

The economic risk in its part described by liquidity is characterized by the following indicators:

- *liquidity ratio I*, being the ratio of cash assets and marketable securities to short-term liabilities;

- *liquidity ratio II*, being the ratio of cash assets, marketable securities as well as receivables and claims to short-term liabilities;

- *liquidity ratio III*, being the ratio of cash assets, marketable securities, receivables and claims, stocks and intermediate settlements to short-term liabilities.

The denominators of these three liquidity ratios are identical, as they are made up by the value of short-term liabilities. On the other hand, their numerators become increased by the less and less liquid components of working capital assets, starting up with the most liquid cash and securities (liquidity ratio I) and ending with the value of total working assets (liquidity ratio III). Both the low level of liquidity, giving rise to current operation difficulties, and its excessive level (overliquidity), indicating wrong utilization of assets, are unfavorable. The value of liquidity ratio I should range from 0.2 to 1, that of liquidity ratio II from 1.2 to 1.5, and that of liquidity ratio III from 1.2 to 2.

- *liabilities to assets ratio* is the ratio of short-term liabilities to receivables and claims. This ratio should equal one. Its value higher than one means borrowing to customers, while the value below one may lead to discontinuation of deliveries.

The economic risk in its part described by the pace of development is characterized by the following indicators:

- *change in sales: 1997 on 1995* - being the ratio of the value of revenues from sales of goods and services in 1996 to the same value in 1994. Fast growth rate of revenues of a given branch points to a rise in the number of enterprises in that branch and/or to an increase in output in the existing establishments, and is undoubtedly a favorable phenomenon.

- *change in the share of income acquisition costs: 1997 on 1995* - being the ratio of the share of costs in revenues in 1996 to the same share in 1994. This indicator is closely related to profitability. A fall in the share of costs in revenues is an indication of improved efficiency of economic activity.

- *ratio of investment outlays to depreciation* - being the ratio of investment outlays to the value of depreciation in the branch. The indicator's value close to one shows that the productive

assets are fully replaced. The values higher than one mean than the value of investment exceeds the value of depreciation, which points to development of the branch.

The structural risk in the part described by economic potential measures are characterized by the following indicators:

- *gross average wage* - being the gross average monthly wage (or salary) in the branch in 1996. A low value of this indicator reflects a low level of labor productivity, and may also imply a necessity of raising wages in a short-term perspective.

- *receivables settlement cycle* - being the ratio of receivables to the value of revenues multiplied by 360 (the number of days of the accounting year). This indicator specifies the average time elapse from making out the invoice until the receipt of cash. Difficulties with receiving cash may result in a loss of liquidity. Therefore, this period should be as short as possible.

- *share of overdue liabilities in total liabilities* - being the ratio of overdue debts to total liabilities. High value of this indicator shows that enterprises of the branch are unable to repay overdue debts. This is undoubtedly a factor considerably increasing the credit risk.

The structural risk in its part reflecting specific features of the process of production is characterized by the following indicators:

- *material-intensity of sold production* - being the ratio of material costs to the value of sold production. This indicator reflects the dependence of the branch performance on changes in material costs. It is also closely related to the value added in the branch, as the indicator's value close to one points to a small share in the product's processing.

- *share of labor costs in sold production* - being the ratio of labor costs including wage-related charges to the value of sold production. This indicator reflects the utilization of labor force in branches. It can point to low level of labor productivity, overemployment, wrong structure of employment. In a branch with a value of this indicator the pressure on wage increase threatens financial results in the branch.

- *inventory turnover ratio* - being the ratio of revenues to yearly average level of inventories. High inventory-intensity of production of the branch increases the credit risk. Enterprises are compelled to freeze a major part of financial assets and to take working-capital credits, which given the high interest rate clearly adds to operation costs.

- *inventory-intensity of finished products in sold production* - being the ratio of inventories of finished products to sold production. The high level of this indicator reduces liquidity and pay also mean difficulties with sales.

The systemic risk in its part described by measures of fiscalism is characterized by the following indicators:

- *share of liabilities vis-a-vis the state budget in total liabilities* - being the ratio of liabilities vis-a-vis the state budget in total liabilities;

- *tax charges on sales* - being the ratio of the sum of statutory charges levied on the financial result, VAT and excise duty to sold production.

The indicators characterizing the fiscalism of the economic system in branches depend on the state policy. The high level of indicators points to a considerable impact of political factors on economic efficiency, which undoubtedly reduces the scope for market forces and the chance for making rational decisions.

The structural risk in its part reflecting the remaining risk factors is characterized by the following indicators:

- *economic risk evaluated by the experts' method* - being the average of partial evaluations made by experts: expectations as to the economic activity situation in the branch, the degree of dependence on the business cycle, the degree of monopolization and the strength of competition - in a five-year perspective;

- *social risk evaluated by the experts' method* - being the average of partial evaluations made by experts: the social and political climate, health and environmental reasons and the degree of regional concentration - in a five-year perspective.

The indicators presented above often carry information from more than one of three aspects of risk. For example, the receivables settlement cycle carries, apart from structural information, also efficiency information. It is impossible to avoid ambiguity in the description of social science phenomena, and it is also the case with the branch investment risk.

This set of risk indicators has undergone a formal analysis allowing to calculate the risk in particular branches.

The first step was the examination of the informative value of the variables. Given the gathered data, it was decided to set the boundary value of the variation coefficient at 0.5. This allowed to eliminate the variable - share of labor costs in sold production.

The ability to discriminate between the analyzed entities proves that an indicator is useful for analyzing a given population. An indicator which does not discriminate between objects is useless. Considerable variation of the indicator also makes the results more resistant to errors of variables' measurement.

In the second step, the variables subjected to the analysis of correlation in order to eliminate variables copying the information. This postulate referred only to variables concerning

the same aspect of the phenomenon and carrying similar information. On the other hand, it did not refer to indicators portraying different aspects of the branch risk. Without the above reservation, the picture of the analyzed phenomenon would be incomplete, as it would lack a statistical reflection of some aspects of the examined subject.

One of the foundations of reasoning about theoretical hidden variables, in this number also the branch credit risk, is an assumption that they are of a syndromatic nature, i.e. they are a system of interrelated phenomena. In practice, it corresponds with a correlation of indicators of the variable, seen as its observable manifestations. Indicators must be correlated with one another if they really express various aspects of the analyzed phenomenon. According to the empirical criterion of evaluation of variables, a variable well reflects the analyzed phenomenon only if, on some level, it correlates with other variables referring to that phenomenon[4].

Taking into account the specificity of research and the kind of the available information, it was decided to set the critical value of the correlation coefficient at 0.7. This allowed to eliminate the following variables:

- gross profitability, which had copied the information contained in net profitability and had led to overrepresentation of the part describing the profitability in its efficiency aspect;
- liquidity ratios II and III, which had copied information contained in the liquidity ratio I, and in the liabilities to assets ratio. With these two indicators not having been excluded, the risk would also have been too strongly correlated with liquidity in the efficiency aspect.

The number of indicators referring to a specific aspect of a non-observable variable should depend on the relative significance of this aspect for the picture of the variable. In practice, the weights of partial phenomena are unknown. Therefore, efforts should be made so that no aspect is overrepresented relative to the remaining aspects, unless it is of special relevance.

In the process of operationalization of theoretical concepts, the choice of indicators is a matter of primary importance. The assumed set of variables determines the results of the study to a much higher degree than formal techniques applied for its processing[5].

As a result of the procedures outlined above, a set of 16 variables has been formed (see Table 1A in Appendix).

The limited availability of information was a serious barrier encountered in the process of drawing up a list of indicators. The economic segment of calculations of the composite scale of

[4] Rutkowski J., *Rozwój gospodarczy i poziom ¿ycia*, GUS, Warsaw 1984, p. 97.

[5] Rutkowski J., *Rozwój gospodarczy i poziom ¿ycia*, GUS, Warsaw 1984, p. 103.

investment risk has been based on information provided by F-1, F-2, F-6 and Z-5 forms made available by Natstatcom of the Kyrgyz Republic.

2. Modelling of investment risk in branches

The final stage of measuring the phenomenon provides for a construction of a statistical index, in which many indicators are integrated into one scalar quantity. The need for a construction of a statistical index results from difficulties with dealing with all dimensions and indicators separately, which considerably impairs getting a grasp of the general picture[6].

The calculations have been carried out on the basis of a factor analysis, being one of the so-called secret modelling methods. In this modelling, apart from directly observable variables, the so-called covert variables, not having unequivocal counterparts among observable variables, are considered. However, these variables often have their concrete interpretation and, since they are associated with overt variables, researchers decide to take them into account in various analyses. The model presented below is confined to measurements of only one non-observable variable - the branch investment risk.

The non-observable variable Y (branch investment risk) is derived as weighted sum of X indicators. The procedure of selection of $w_1, ...,w_n$ coefficients responsible for the share of $X_1, ...,X_n$ indicators in the $Y_1, ...,Y_T$ variable is automatic and iterative. In the first step we assume the initial value of v_i weights:

$$v_1(1) := 1 \quad \text{for } i = 1, 2, \ldots, N.$$

Then we calculate the standard deviation of the Y variable, set by means of v_i weights:

$$f(1) = \left(1/T \sum_{t=1}^{T} \left(\sum_{i=1}^{N} v_i(1)\, X_{ti} \right)^2 \right)^{-0,5}.$$

With this deviation we standardize v weights to obtain appropriate w weights:

$$w_i(1) = f(1)\, v_i(1) \quad \text{for } i = 1, 2, .., N.$$

[6] Rutkowski J., *Rozwój gospodarczy i poziom ¿ycia*, GUS, Warsaw 1984, p. 90.

In the following step, by means of w_i weights, we set standardized values of the Y variable:

$$Y_t(1) = \sum_{i=1}^{N} w_i(1)\, X_{ti} \qquad \text{for } t = 1, 2, \ldots, T$$

The set Y values are treated as variables in the regression function, in which a non-observable Y variable is the regressor:

$$X_{ti} = b_i(1)\, Y_t(1) + c_{ti}(1) \qquad \text{for } i = 1, 2, \ldots, k \text{ and } t = 1, 2, \ldots, T$$

The least-squares estimate of $b_1(1)$, ..., $b_N(1)$ ends the first iteration.
The 2nd, ..., sth iterations are identical with the first. In the sth iteration (s = 2, 3, ...) the only modification is that of v_i:

$$v_i(s) = b_i(s-1) \qquad \text{for } i = 1, 2, \ldots, N$$

The evaluation of the level of the Y variable is considered completed, if the corrections made in the sth iteration are insignificant

$$\frac{Yt(s) - Yt(s-1)}{Yt(s)} \leq \varepsilon \qquad \text{for all t,}$$

where ε stands for an optionally small number[7].

The gradation of branches on the composite scale of investment risk has been obtained by means of the pattern method. Euclidian distance of all branches from the hypothetical "pattern" branch has been calculated in a 16-dimensional space, set by the number of variables. The pattern has been described by the "most desirable" values of variables. These are either the best values of variables in the entire population of branches - e.g. net profitability amounting to 20 percent, or the values of variables resulting from general theories - e.g. liquidity equal to 0.4. The objects "closest" to the pattern are characterized by the most favorable parameters from the point of view of the set criterion, i.e. the smallest investment risk. Table 2A in appendix presents the pattern's values.

For easier reference to the risk ranking branches have been divided into risk classes grouping branches with a similar level of branch investment risk. Consequently, apart from the

[7] Wiśniewski M.: *Źródła i rozmiary drugiego obiegu gospodarczego w Polsce*, Ekonomista 1984.

hypothetical "pattern" branch, a hypothetical branch describing the most negative values of indicators in the population of analyzed branches has been devised. This branch is characterized by the hypothetically highest level of branch credit risk. The medium distance between the "pattern" branch and the hypothetically worst branch is the midpoint of the risk scale dividing it into branches closer to the "pattern" and branches closer to the hypothetically worst branch. Classes grouping branches representing a similar level of risk emerge through shifting from the midpoint in opposite directions by the standard deviation in the level of risk in branches. Hence, subsequent risk classes have the length of standard deviation from the average level of branch credit risk in the population of examined branches.

3. Results of the analysis of investment risk in branches of the Kyrgyz economy

The analysis covered 53 branches of the Kyrgyz economy. The data referred to a group of 2,157 enterprises dominated by state-owned firms. Availability of statistical data was the reason for confining the survey to such a population of enterprises. The revenues of analyzed firms accounted for 56 percent of revenues of all enterprises in the Kyrgyz Republic, and their gross profits accounted for some 30 percent of profits of all Kyrgyz enterprises.

The scope of activities of enterprises in the examined branches is very diversified, with the research covering both industrial and non-industrial branches (commercial, transport, construction and financial services). The distribution of key economic figures, such as the revenues from business activity, the financial result or the number of economic entities making up the branch. The largest branch presented in the investment risk analysis is that of "construction companies", composed of 269 entities. In 8 branches the number of enterprises exceeds 100 units, while in 19 branches it is below 10. The least numerous branches presented in the analysis consist of 3 economic entities. These are "air transport", "electric city transport", "publishers", "administration", and "manufacture of fish products for consumption". This results from the fact that the Statistical Office is not allowed to reveal data concerning branches grouping not more than two entities. Consequently, the risk analyses could not cover such branches of key importance for the Kyrgyz economy, such as "mining and processing of precious metals' ores" or "crude oil refining".

In terms of the share in revenues of the national economy, "electrical power engineering", accounting for more than 11 percent of revenues of Kyrgyz enterprises, was the branch of major significance for the Kyrgyz economy among those covered by the research. The analysis also covers branches which in 1997 accounted for only 0.01 percent of the national economy's

revenues. These were such branches as "theaters", "cinemas", "road maintenance". "other commercial activities", "information and accounting services", "public catering", as well as "administration and construction supervision".

Table 1 presents the composite scale of investment risk supplemented with information shedding more light on the situation of branches, which may prove helpful in the interpretation of results.

The first column reveals the position occupied by a given branch in the ranking, with the order concerning the entire ranking, and not only the risk class. The second column shows the code of the national economy classification branch (according to Ęëřńńčôčęřňîđ îňđřńëĺé ířđîäíîãî őîç˙éńňâř). The next column shows the number of enterprises covered by the research in branches. Together with the number of enterprises of a given branch, the percent share of a branch in revenues of the national economy is an indication of the significance and size of the branch.

The values of the composite indicator of investment risk are of an exclusively ordering nature and should not be associated with any interpretation. Moreover, it is not methodologically justified to compare indicators between branches to find out by how many percent the risk is smaller or larger. Negative values of indicators point to a considerable distance separating branches from the pattern in the adopted method of scale creation. These indicators may assume a positive value if a different method is employed.

When reviewing the ranking of investment risk it should be remembered that the risk indicator in branches is a mean value, as it refers to the entire branch and does not take into account the diversification of enterprise standing in branches. In many branches, the diversification of enterprises in terms of efficiency is considerable, which is a significant factor shedding more light on the branch risk. It can be assumed that the diversification of efficiency, measured with the diversification of net profitability also reflects, to a considerable degree, the diversification of investment risk.

In view of the above, an indicator of financial result differential has been devised. It is presented in the last column of Table 2. This indicator is defined as a ratio of the difference between the net profit value obtained by enterprises of a given branch and the value of net loss incurred by enterprises of that branch to the sum of these figures. The value of the differential indicator ranges from -1 to +1. If it is close or equal to one, it means that all (or almost all) enterprises in the branch have obtained profits, and if it is close or equal to -1 it means that all (or almost all) enterprises in the branch have incurred losses. The closer the value of the indicator to zero, the larger the diversification of the branch.

The branches in which the indicator of financial result differential found itself in the [-0.3 ; +0.3] interval have been considered the most diversified in terms of efficiency.

In our research the indicator of financial result differential is not applied as a variable determining the composite indicator of risk for industrial branches due to its strong correlation with the net profitability indicator.

The number of branches with the highest degree of diversification, i.e. those in which the indicator of financial result differential ranged from -0.3 to +0.3 amounted to 7, this way making up 13 percent of the analyzed population.

From the point of view of reliability of the composite indicator of risk, considerable diversification of profitability inside branches is not a favorable occurrence. In Table 1, the branches marked in red are, in fact, branches with the least reliable composite indicator of risk.

The changeability of the investment risk indicator has closed in the interval of its four standard deviation. Consequently, the ranking has been divided into four classes of risk: low and medium risk i.e. those grouping branches with the risk indicator better than average in the analyzed population, and high and very high risk classes, grouping branches with the risk indicator worse than average.

Table 1. Investment risk ratio for branches

Rank	Code	Branch	Number of enterprises	The share of a branch in rev. of the nat. economy	Risk scale	Finantial result differential
LOW RISK						
1	91600	Tourism	16	0,26%	**1,919**	0,88
2	97000	Administration	3	0,01%	**1,681**	1,00
3	82000	Information and Accounting Services	7	0,01%	**1,590**	0,51
4	51300	Air Transport	3	3,80%	**1,575**	-1,00
5	52000	Communication	115	2,05%	**1,406**	0,93
6	90300	Consumer Services Establishments	10	0,07%	**1,403**	0,47
7	11100	Electrical Power Engineering	7	11,17%	**1,251**	0,88
8	87400	Security Services	9	0,09%	**1,235**	0,98
9	66000	Design Offices	44	0,20%	**1,152**	0,88
10	84000	Other Commercial Activities	4	0,01%	**1,136**	0,76
11	92200	Education	14	0,03%	**1,118**	-0,03
12	85000	Geology Prospecting Entities	7	0,24%	**0,998**	1,00
MEDIUM RISK						
13	69000	Administration and Construction	5	0,01%	**0,688**	-0,92

Rank	Code	Branch	Number of enterprises	The share of a branch in rev. of the nat. economy	Risk scale	Finantial result differential
		Supervision				
14	71311	Canteens	24	0,02%	**0,461**	0,45
15	91500	Health	9	0,14%	**0,342**	0,82
16	16100	Manufacture of Construction Materials	47	3,29%	**0,108**	0,95
17	18200	Meat and Dairy Products	38	1,08%	**-0,015**	0,45
18	51122	Electric City Transport	3	0,26%	**-0,038**	-1,00
19	18300	Manufacture of Fish Products for Consumption	3	0,01%	**-0,040**	-0,93
20	71210	Retail Trade	102	0,23%	**-0,073**	0,39
21	18100	Other Food Products	78	3,74%	**-0,081**	0,77
HIGH RISK						
22	17100	Textile	21	4,65%	**-0,143**	0,79
23	19200	Flour-Grinding, Cereal and Mixed Fodder	21	1,47%	**-0,151**	0,70
24	51121	Motor Transport	129	1,79%	**-0,168**	0,44
25	93612	Cinemas	18	0,01%	**-0,188**	-0,96
26	19700	Other Branches	46	1,80%	**-0,271**	-0,03
27	14000	Machinery Construction and Metal-Working	119	3,80%	**-0,338**	0,85
28	71120	Co-operative Wholesale Trade	10	0,03%	**-0,354**	-0,88
29	61000	Construction Companies	269	3,73%	**-0,373**	0,37
30	71240	Co-operative Retail Trade	127	0,19%	**-0,418**	-0,31
31	51520	Other Types of Transport	30	0,24%	**-0,436**	0,98
32	21100	Plant Growing	143	2,55%	**-0,445**	0,24
33	63000	Contractor Repair and Construction Institutions	38	0,15%	**-0,464**	0,22
34	90200	Municipal Economy	90	0,75%	**-0,509**	-0,83
35	71100	Wholesale Trade	19	0,08%	**-0,541**	-0,14
36	31000	Forestry Entities	33	0,07%	**-0,546**	0,86
37	71320	Public Catering	6	0,01%	**-0,553**	-0,93
38	21200	Animal Husbandry	109	2,51%	**-0,596**	0,23
39	71212	Pharmacy	24	0,09%	**-0,674**	0,35
40	17200	Sewing	44	0,40%	**-0,685**	0,59
41	90100	Housing Economy	9	0,09%	**-0,723**	-0,80
42	51123	Road Maintenance	4	0,01%	**-0,780**	-0,80
43	93611	Theatres	6	0,01%	**-0,882**	-0,91
44	87100	Publishers	3	0,04%	**-0,886**	-0,58

Rank	Code	Branch	Number of enterprises	The share of a branch in rev. of the nat. economy	Risk scale	Finantial result differential
45	71213	Retail Trade Network & Warehouses	10	0,03%	**-0,920**	-1,00
46	13100	Chemical	4	0,07%	**-0,979**	0,83
47	15000	Forestry, Woodworking and Cellulose	20	0,19%	**-1,003**	0,64
48	81000	Procurement	33	0,05%	**-1,034**	-0,26
49	17300	Leather, Fur, Boots and Shoes	17	0,42%	**-1,047**	0,87
VERY HIGH RISK						
50	95000	Science	17	0,10%	**-1,131**	0,69
51	11300	Coal	8	0,39%	**-1,150**	-0,95
52	11200	Fuel	9	0,75%	**-1,354**	-0,95
53	22300	Support for Farming Production	86	0,13%	**-1,669**	-0,64

Source: author's calculations using Natstatcom data

Out of 53 analyzed branches, 12 found themselves in the low risk class and 9 in the medium risk class. The high risk class with 28 branches was the most numerous one, while 4 branches found themselves in the very high risk class.

The share of the low risk class in revenues of the Kyrgyz economy amounted to 18 percent, that of the medium class risk to 9 percent, of the high risk class to 25 percent and of the very high risk to 1 percent. Considerable share of the high risk class well reflects the generally poor condition of the Kyrgyz economy.

The distance of the best branches from the pattern branch is considerable, although it is difficult to imagine the existence of a branch achieving ideal results from the point of view of all criteria. This results, first of all, from the fact that the performance of the branch depends on results of many different entities. Hence, it is difficult to find a branch in which all entities would achieve ideal values of indicators, which would allow it to achieve pattern values. Another obstacle here is the set of indicators itself. The achievement of ideal results from the point of view of all criteria is impossible. One cannot couple low material-intensity of production with low share of labor costs and low burden of taxes imposed on sales. Usually, high material-intensity is accompanied by a low share of labor costs and vice versa. However, in these few cases when production is characterized by low shares of both labor and material costs in revenues, it is subject to high tax rates, licenses and sometimes even state monopoly, so a major part of profits is taken over by the State Treasury one way or the other. It is also difficult to imagine a branch with high investment expenditures not having an adverse effect on its liquidity indicators. Nevertheless, risk calculations show that even high financial efficiency reported by

branches does not reduce the risk, as there are systemic or structural restrictions. Hence, for the time being there are no very low investment risk branches in the Kyrgyz economy.

The ranking is topped by "tourism" branch composed of holiday houses, guest-houses, hostels, shelter-homes and travel offices. However, the beauty of Kyrgyz nature is not enough to secure development of this branch. Most tourist facilities are heavily depreciated and require sizable investment. Administrative regulations do not contribute to the branch development, either, and poor travel safety standards discourage many tourists. For the Kyrgyz tourist industry to develop, the completion of the road connecting Alma-Ata with Issik-Kul becomes a matter of primary importance. This way the lake would become a leisure attraction for the population of the city complex of two million inhabitants.

In the class of small investment risk only one industrial branch was recorded. It was "electrical power engineering", a leading branch of the Kyrgyz economy facing development chances provided by markets of the entire Central-Asian region.

The remaining branches of the small risk class are non-industrial branches. Among other, they include: "air transport", "communication", "security services", "design offices", "education" and "other commercial activities", grouping fields of activity non-existent in a centrally-planned economy and absolutely indispensable in a market economic system: "advertising", "marketing", "stock exchanges" and "audit".

This situation well reflects the fact of the generally lower level of risk involved with investment in non-industrial activities in Kyrgyzstan. The transition from a centrally-planned to a market economy revealed the existence of many market niches, especially in the non-material sphere, the entering of which provides opportunities for fast development.

Interestingly, apart from "electrical power engineering", the top industrial branches in the ranking are food-processing industry branches present in the medium risk class, i.e. the manufacture of meat, dairy and fish products, sugar, alcoholic beverages and tobacco, being the branches in which production growth is facilitated by the unsatisfied market inherited from the former system.

In the medium risk class there was one more industrial branch - the "manufacture of construction materials", owing its good performance to strong demand for its products in the neighboring countries - Uzbekistan and Kazakhstan.

The lowest positions in the ranking of risk are occupied by two industrial branches - "fuel" and "coal", one branch involved with agriculture - "support for farming production", as a consequence of the collapse of state-owned farms (*sovkhoz*), as well as "science", in connection

with a dramatic decline for its services, following the sharp fall in industrial production in the former USSR.

4. Conclusions - possible applications of results of the analysis of investment risk in branches

The level of risk involved with the activities of a financial institution is mostly decided by the quality of its assets. This is the key factor of the firm's success or bankruptcy. International analyses of crises indicate that poor quality of assets, including the investment portfolio was the most frequent cause these institutions' bankruptcies[8].

Since the risk cannot be fully eliminated from the investment activity, financial institutions while making investment decisions can only try to minimize this risk and prevent its consequences, i.e. to get insured against possible losses. A firm totally avoiding risk will be unable to make profits. Hence, profitability and customer's trust can be attained not by avoiding risk altogether, but by identification, estimation of that risk and its proper managing. Financial institutions are successful as long as the risk taken by them remains within reasonable limits, is properly supervised and commensurate with their financial assets and skills of their staff and management.

Risk can be limited, primarily, by means of systemic norms, i.e. norms resulting from legal provisions regulating the activities of the financial sector institutions. However, risk can be best reduced by means of its safe management, and the ranking of investment risk in branches is to serve this very purpose.

This ranking can be applied on three levels. The first of them is involved with specifying the strategy of activities, in order to determine the sectors on which the firm will concentrate its investment activity.

While defining the strategy of its operations, a financial institution having access to the ranking of investment risk in branches may resign from investment in branches identified with the highest classes of risk. It may also confine its activities to branches representing the lowest risk classes, or specialize in investment in more risky branches.

The next level is the moment of considering specific investment projects. While estimating the effects of such undertakings in branches classified in higher risk groups, one must not forget the impact of the risk level on the expected value of the future return on investment.

[8] Dariusz Lewandowski, *Bezpieczne zarz'dzanie ryzykiem kredytowym w banku komercyjnym*, Olympus, Warsaw 1994, p. 5.

The ranking of risk also makes it easier to set the conditions of the investment project and to get them accepted in the course of negotiations.

The ranking of investment risk can also be useful in the process of evaluation of the activities of a financial institution from the point of view of limiting the risk concentration. Thanks to the ranking of risk we can get an insight into the current structure of the investment portfolio. Due to the threat of sectoral concentration, there is a need for managing the excessive level of these involvements. A financial institution is rather not in a position to exert any sizable impact on the situation of a given branch. However, it is in a position to avoid excessive sectoral concentration by means of diversification of risk.

Hence, the ranking is an instrument of evaluation of investment risk in branches, which is helpful not only in making current investment decisions, but also in formulating the development strategy of a financial institution an in evaluation of its investment portfolio.

The ranking of investment risk in branches can also be applied by credit departments of banks. Namely, it would be helpful in:

- precise specifying the field of lending activities and the kind of the bank's customers. To this end, it is necessary to define - within the framework of the adopted strategy - the fields in which the bank can become involved immediately, as well as the fields which may become a subject of its interests in the future. However, the risk accompanying these endeavors must be first identified and defined. The bank should not engage in all kinds of economic activity, as it simply has no prepared staff to do that (e.g. credits for a shipyard differ considerably for agricultural credits). In view of the above, there is a need for choosing a market segment in which the bank is to become involved or specialized;
- specifying branch, sectoral and geographical limits. With the diversification of the portfolio of borrowers within the framework of a selected area of activities some limits concerning the bank's involvement in particular branches or sectors should be set. This is to be done on the basis of available, up-to-date and reliable data concerning the profitability and overall economic and legal condition of these branches;
- specifying the intended structure and value of the credit portfolio;
- defining the scope of the performance, competence and powers in the bank's lending activities;
- defining the conditions of lending;
- adopting the procedure of credit approval;
- specifying the scope of investigating the customer's credit capacity;
- defining a policy of legal forms of security acceptable by the bank;

- defining a policy in the field of debt restructuring;
- setting the principles of classification of borrowers' liabilities;
- working out a precise strategy of creating bad debts reserves;
- setting the principles and procedures of debt repayment enforcement.

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Appendix

Table 1A. Factors determining the level of investment risk in branches

Investment risk in branches						
Efficiency-related aspect			Structural aspect		Systemic aspect	
Profitability	Liquidity	Pace of development	Economic potential	Specific features of the process of production	Fiscalism	Remaining
Net profitability	Liquidity ratio I Liabilities to assets ratio	Change in sales Change in the share of income acquisition Ratio of investment outlays to depreciation	Gross average wage Share of overdue liabilities in total liabilities Receivables settlement cycle	Material-intensity of sold production Inventory-intensity of finished products in sold production Inventory-turnover ratio	Share of liabilities vis-a-vis the state budget in total liabilities Tax charges on sales	Economic risk evaluated by the experts' method Social risk evaluated by the experts' method

Table 2A. Values of indicators in the population of analyzed branches

Code	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15	V16	Risk scale
11100	0,107	0,024	1,696	1,944	-0,010	5,000	2,083	0,000	140,799	0,084	0,137	8,137	0,041	0,123	4,5	3,5	1,251
11200	-0,034	0,002	1,266	1,810	-0,284	0,000	1,026	0,209	223,451	0,339	0,356	1,681	0,093	0,221	3,0	3,0	-1,354
11300	-0,066	0,002	0,897	1,944	-0,010	0,000	1,026	0,403	225,268	0,454	0,190	1,825	0,081	0,220	3,5	3,0	-1,150
13100	0,049	0,005	0,616	1,199	-0,256	0,000	0,772	0,164	88,414	0,912	0,145	2,999	0,274	0,193	3,0	3,0	-0,979
14000	0,079	0,048	0,718	1,360	-0,002	0,163	1,031	0,190	89,664	0,200	0,199	2,416	0,175	0,138	3,5	3,5	-0,338
15000	0,021	0,025	0,667	0,922	-0,020	0,004	0,733	0,168	100,075	0,519	0,135	2,192	0,127	0,147	3,3	2,5	-1,003
16100	0,067	0,023	0,433	2,407	0,042	0,697	1,400	0,060	36,778	0,247	0,121	5,481	0,124	0,093	4,0	3,0	0,108
17100	0,019	0,016	0,363	1,127	-0,084	0,059	0,745	0,059	32,498	0,161	0,131	3,949	0,039	0,091	4,0	4,0	-0,143
17200	0,021	0,029	0,653	0,903	-0,112	0,055	0,745	0,280	93,726	0,276	0,212	1,891	0,085	0,174	3,5	4,0	-0,685
17300	0,101	0,019	0,479	1,088	-0,021	0,094	0,745	0,259	67,102	0,185	0,357	1,454	0,071	0,186	3,0	3,5	-1,047
18100	0,065	0,026	0,499	1,261	0,061	1,184	0,940	0,073	74,981	0,393	0,162	3,420	0,090	0,266	4,0	4,0	-0,081
18200	0,012	0,029	0,626	1,074	-0,030	0,052	0,940	0,052	68,780	0,539	0,078	7,915	0,112	0,132	4,0	4,0	-0,015
18300	-0,322	0,008	0,293	1,084	-0,365	0,000	0,940	0,001	54,138	0,014	0,126	2,574	0,198	0,163	3,5	4,0	-0,040
19200	0,070	0,020	0,583	1,944	-0,010	0,277	1,422	0,068	131,832	0,347	0,126	2,024	0,024	0,173	4,0	4,0	-0,151
19700	-0,026	0,035	0,892	0,866	-0,085	0,231	1,114	0,029	170,142	0,361	0,163	4,310	0,054	0,141	4,0	4,0	-0,271
21100	0,046	0,007	0,280	1,616	0,016	0,915	0,437	0,089	59,769	0,351	0,302	2,051	0,083	0,127	4,0	4,5	-0,445
21200	0,055	0,012	0,289	2,430	0,161	0,915	0,437	0,059	60,538	0,347	0,389	1,963	0,105	0,131	4,0	4,0	-0,596
22300	-0,096	0,008	0,955	0,204	-0,031	0,915	0,449	0,112	700,083	0,632	0,349	0,835	0,038	0,185	4,0	4,0	-1,669
31000	0,088	0,007	0,417	1,750	0,114	7,000	0,413	0,038	122,265	0,264	0,392	1,877	0,049	0,125	3,0	4,0	-0,546
51121	-0,025	0,056	0,669	1,292	-0,008	1,797	0,717	0,000	59,390	0,642	0,088	10,164	0,056	0,457	4,0	3,0	-0,168
51122	-0,058	0,852	0,239	1,786	0,001	0,000	0,717	0,000	4,433	0,045	0,124	8,734	0,002	0,042	3,0	4,0	-0,038
51123	-0,015	0,019	0,363	1,944	-0,010	0,631	0,717	0,000	67,055	0,723	0,258	1,954	0,024	0,061	4,0	4,0	-0,780
51300	-0,042	0,164	0,992	1,963	-0,182	0,370	2,419	0,000	38,784	0,027	0,039	22,218	0,152	0,140	4,0	4,0	1,575
51520	0,207	0,173	1,779	12,000	0,318	0,011	0,724	0,003	112,147	0,412	0,135	6,604	0,150	0,220	3,0	3,0	-0,436
52000	0,113	0,092	0,295	1,555	0,035	0,629	1,492	0,001	45,036	0,126	0,060	17,165	0,018	0,227	5,0	5,0	1,406

Code	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15	V16	Risk scale
61000	0,007	0,034	0,838	1,168	0,054	0,166	1,054	0,004	177,319	0,320	0,208	4,293	0,096	0,150	3,5	4,0	-0,373
63000	0,001	0,063	0,602	0,761	0,081	1,516	0,319	0,001	135,148	0,311	0,201	2,824	0,062	0,174	3,8	4,0	-0,464
66000	0,062	0,311	0,673	2,284	0,155	0,687	1,410	0,000	59,649	0,021	0,026	14,919	0,155	0,234	4,0	4,0	1,152
69000	-0,055	0,026	0,424	1,944	-0,010	0,915	0,915	0,040	102,138	0,003	0,013	21,575	0,074	0,061	3,5	4,0	0,688
71100	-0,032	0,041	0,471	0,992	0,259	0,915	0,466	0,045	290,987	0,487	0,052	0,613	0,023	0,496	4,0	4,0	-0,541
71120	-0,112	0,007	0,538	3,808	0,609	0,915	0,467	0,002	259,216	0,139	0,023	1,597	0,042	0,779	3,0	4,0	-0,354
71210	0,014	0,049	0,190	0,951	0,163	0,915	0,467	0,115	70,524	0,091	0,025	1,481	0,029	0,225	4,0	4,0	-0,073
71212	0,012	0,014	0,465	0,838	0,247	0,915	0,467	0,022	399,577	0,509	0,033	0,812	0,009	0,351	4,0	4,0	-0,674
71213	-0,379	0,009	0,487	0,564	-0,321	0,915	0,467	0,000	343,990	0,021	0,068	1,065	0,009	0,171	3,0	4,0	-0,920
71240	-0,100	0,018	0,304	0,567	0,073	0,915	0,467	0,006	185,131	0,319	0,067	0,997	0,050	0,335	3,8	4,0	-0,418
71311	0,115	0,061	0,226	0,442	-0,129	0,915	0,467	0,007	26,767	0,182	0,011	5,994	0,185	0,369	4,0	4,0	0,461
71320	-0,173	0,012	0,167	0,619	-0,308	0,915	0,467	0,005	77,944	0,394	0,148	0,903	0,087	0,275	3,7	4,0	-0,553
81000	-0,081	0,025	0,433	1,194	0,268	0,000	0,364	0,020	297,442	0,348	0,280	0,882	0,040	0,398	3,5	4,0	-1,034
82000	0,045	2,460	0,155	0,237	0,134	0,000	1,624	0,000	32,959	0,000	0,179	5,279	0,129	0,223	4,6	5,0	1,590
84000	0,178	4,954	0,193	1,297	0,243	9,000	1,815	0,000	3,603	0,000	0,052	18,647	0,644	0,318	4,3	4,8	1,136
85000	0,070	0,138	0,770	1,083	0,063	0,064	1,546	0,001	46,254	0,394	0,076	7,040	0,342	0,179	4,2	4,5	0,998
87100	-0,075	0,092	0,568	3,352	-0,234	0,000	1,815	0,654	61,049	0,336	0,475	1,095	0,006	0,066	4,0	4,5	-0,886
87400	0,040	0,313	1,563	6,000	0,034	0,000	0,503	0,000	57,130	0,000	0,037	25,266	0,281	0,110	4,0	3,8	1,235
90100	-0,056	0,108	0,230	8,000	0,032	0,000	0,851	0,810	118,781	0,189	0,097	1,205	0,013	0,090	4,2	4,0	-0,723
90200	-0,343	0,016	0,959	0,747	-0,189	0,022	1,146	0,001	241,119	0,432	0,193	4,629	0,071	0,200	4,0	4,0	-0,509
90300	0,035	0,307	0,762	1,911	-0,121	0,000	1,240	0,003	44,334	0,017	0,043	20,376	0,257	0,242	4,2	4,0	1,403
91500	0,080	0,014	0,538	1,859	0,097	0,000	1,411	0,000	65,161	0,525	0,123	5,057	0,124	0,152	4,0	5,0	0,342
91600	0,103	0,225	0,644	1,644	-0,121	0,007	1,411	0,000	38,014	0,061	0,039	15,958	0,360	0,277	4,8	5,0	1,919
92200	-0,005	0,654	0,409	2,363	0,010	0,075	0,915	0,000	10,061	0,000	0,072	12,137	0,173	0,178	4,0	5,0	1,118
93611	-1,315	0,729	0,839	2,088	0,274	0,000	0,915	0,000	56,551	0,000	0,249	3,647	0,047	0,095	2,5	4,0	-0,882
93612	-0,267	0,127	0,078	0,424	-0,334	0,012	0,915	0,000	9,438	0,145	0,069	8,608	0,034	0,199	3,0	4,0	-0,188

Code	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15	V16	Risk scale
95000	0,067	0,161	0,695	1,437	0,031	0,035	0,915	0,039	434,707	0,844	0,367	1,716	0,067	0,277	3,5	5,0	-1,131
97000	1,179	0,255	0,857	1,944	-0,010	4,500	0,915	0,000	247,460	0,000	0,000	20,876	0,071	0,635	4,0	4,0	1,681
Pattern branch	0,200	0,400	1,000	10,000	0,609	9,000	1,000	0,000	3,603	0,000	0,000	25,266	0,002	0,042	5,0	5,0	2,516
Highest risk	-0,370	0,002	1,779	0,204	-0,365	0,000	0,319	0,810	700,083	0,912	0,475	0,613	0,644	0,779	2,0	2,0	-2,692

Source: author's calculations using Natstatcom data

V1- net profitability

V2- liquidity ratio I

V3- liabilities to assets ratio

V4- change in sales: 1997 on 1995

V5- change in the share of income acquisition costs: 1997 on 1995

V6- ratio of investment outlays to depreciation

V7- gross average wage

V8- inventory-intensity of finished products in sold production

V9 - receivables settlement cycle

V10- share of overdue liabilities in total liabilities

V11- material-intensity of sold production

V12- inventory turnover ratio

V13- share of liabilities vis-a-vis the state budget in total liabilities

V14- tax charges on sales

V15- economic risk evaluated by the experts' method
V16- social risk evaluated by the experts' method