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Full Length Research Paper

Performance evaluation of the Serbian Credit Bureau model

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This paper discusses key functional characteristics of the Serbian Credit Bureau (SCB) model and analyses its performances using the methodology of International Finance Corporation, the member of World Bank group. The results show high level of SCB business performances which are preconditioned by its unique technological-organisational structure. These results point out the fact that creditors in Serbia base their credit decisions on the reliable and top-quality information which considerably lowers the risk, and consequently the interest rates on granted loans. The ultimate result is controlled expansion of credit activity with the maintenance of citizens and economy indebtedness at optimum level.

Key words: Credit bureau performance evaluation, credit reports, loan placements, hit ratio, coverage ratio, complaint.

INTRODUCTION

One of the major problems in the operation of commercial banks and other creditors is maintenance of liquidity through monitoring financial discipline of bank clients. For these purposes many national economies formed different models for revealing, monitoring, and controlling bank clients' financial non-discipline. In these efforts the best results have been achieved by the economies of highly developed western countries which have substituted legal instruments in a struggle against financial non-discipline with systematic monitoring of bank clients behaviour, thus achieving a number of positive effects not only in the area of financial discipline but also in the derived areas such as social behaviour, tax liability or health record.

Having learnt from the experience of other countries and based on the clearly defined necessity to systemise and materialize the businesses of monitoring and putting an end to financial non-discipline in the form of organization that would be available to creditors on the territory of Republic of Serbia, the relevant institutions have conducted an initiative for establishing the first credit

bureau in Serbia. As the result of these initiatives the first Serbian Credit Bureau (SCB) was formed starting with its operative work on November 15th 2004.

Information that are analyzed in this paper were collected on the basis of research conducted in the Association of Serbian Banks (ASB) under whose authority functions the first credit bureau in modern Serbian history.

SUMMARY OF CREDIT BUREAU LITERATURE

In present circumstances about 25% of population in developing countries, according to the World Bank survey (International Finance Corporation, 2006), has the access to the formal financial services of the banks and other financial organizations in contrast to developed countries where this percentage goes up to 90%. This kind of situation results from the fact that the banks and other creditors in undeveloped economies are faced with considerable credit risk which results in lesser scope of granted loans and higher interest rates.

Credit bureau institution can help correct this imbalance in favour of those who do not have the access to financial services, thus enabling banks and other creditors to gather and share data about millions of potential client

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Figure 1. The difference between private and public credit bureau regarding the types of services.

The importance of information in credit markets is well established in seminal papers such as Akerlof, (1970) and Stiglitz and Weiss (1981). Enabling data sharing between creditors, credit bureau helps them to easily make the distinction between good and bad debtors, to form the adequate price policy, cut the time of loan approval and lower screening costs as well as other transactional costs. The research conducted in banking sector of 34 national economies (Miller, 2003) where the credit bureau operates showed that more than half of the respondents thought that the possibility of using credit information obtained from the credit bureau for making the credit decision, makes the time of loan approval shorter, lowers the costs and the default rate for more than 25%. The usual classification of credit bureaus is on public and private credit bureaus. According to the World Bank, (2009) data, the category of public credit bureaus may be found in about 78 countries in the world, most of which are developing countries. In these countries the government plays an important role in direct distribution of credit data, by establishing public credit bureau under the supervision of the Central Bank or indirectly through legal regulations which forces banks to exchange credit information. The World Bank (2004a) suggests that the banking sector in developing countries is characterized by weak competition and high concentration, the environment in which major banks are often unwilling to share credit information about their steady clients with other banks, thus taking the risk to lose them. In such conditions it is not advisable for the Central Bank to form public credit bureau which is usually characterized by restrictions in the respect of variety of data available and the number of services that their clients may use. As a better solution it has been suggested to establish a private credit bureau which among other things gathers data from a larger number of different sources.

The World bank (2009) points out to important difference that exist between private and public credit bureaus regarding their services (Figure 1).

Private credit bureaus have been made as a response to commercial possibilities and conditions on the market (Jappeli and Pagano, 1993). Their basic characteristic is

better adaption to credit market conditions that is to creditors requests. Data source of private credit bureaus is more extensive than those of public credit bureaus and it includes commercial organizations, mobile phone operators, courts, tax authorities and others. In the offer of this credit bureau category there is usually a number of additional services such as credit scoring, portfolio monitoring, fraud detection, collections, marketing services and others. World Bank (2009) indicates that this category of credit bureau is applied in the practice of 81 national economies, that is in almost all developed economies (except in France). In some countries (30) private and public credit bureaus are applied simultaneously. Jappeli i Pagano, (2002) conducted one of the first empirical research related to the existence of the institution of credit bureau and the effects that it has in different national economies. Their results indicate that the existence of credit bureau in a form of public or private CB is related to broader credit market and lower credit risk.

Luoto et al. (2004) suggest that three distinct levels of information sharing are possible between institutions. The lowest level is that of zero information sharing. In such an environment, financial institutions have exclusive knowledge of their customer base. The next level of information sharing is the exchange between lenders of negative information, regarding borrower defaults and arrears. The most sophisticated information-sharing arrangements include positive borrower data in addition to the negative data.

SERBIAN CREDIT BUREAU MODEL

The concept of Credit Bureau in Serbia is based on previously analyzed models that function in Western European countries, especially the German model >>SCHUFA<< because of its national Credit Bureau concept, its positive approach and its preparations already made for the use of Basel II. Credit Bureau is one of the functions of the Association of Serbian Banks. All decisions and tariffs are made by the Secretary

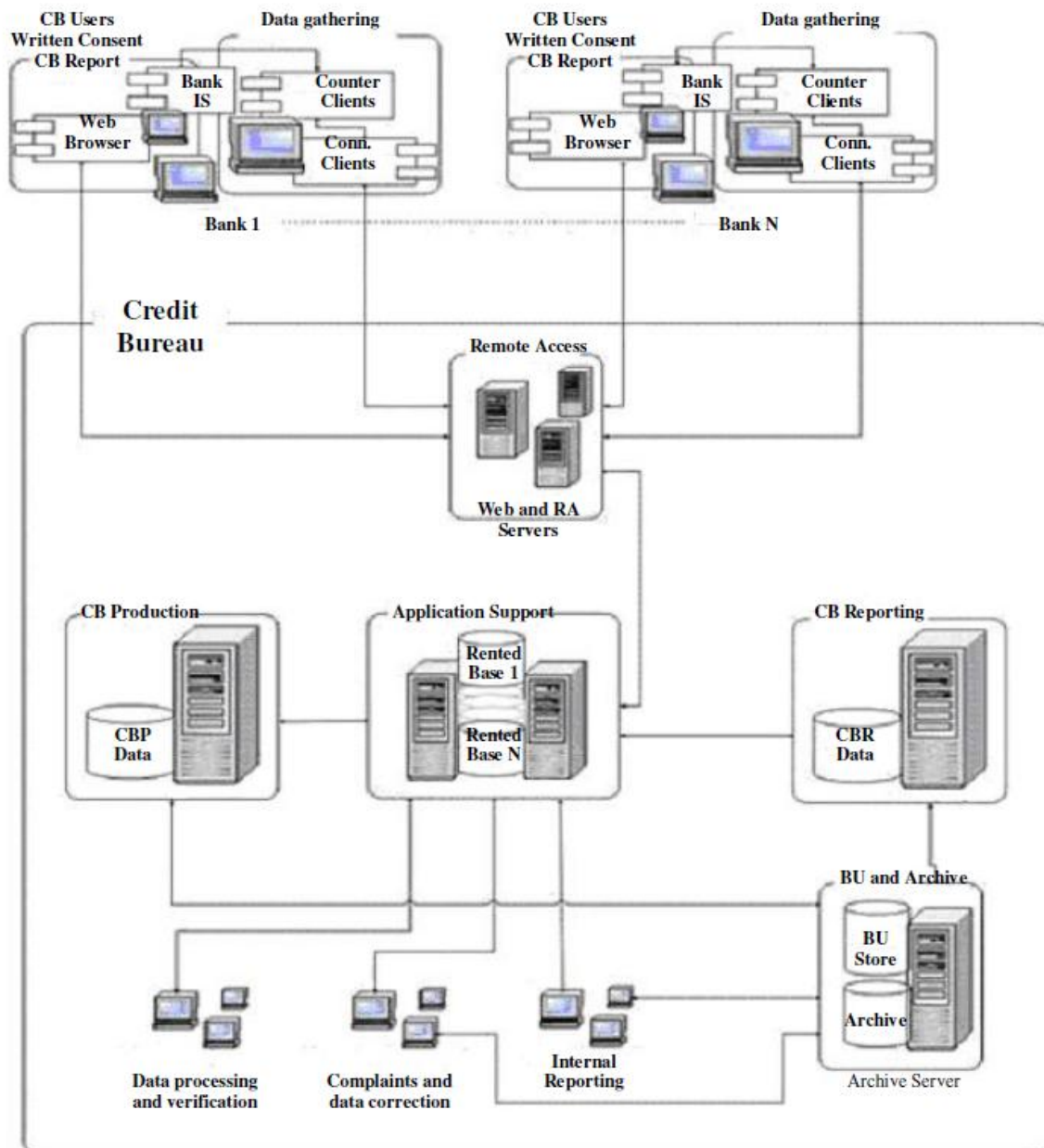


Figure 2. Serbian credit bureau architecture.

General and the Board of Directors. The body called Business Council at the expert level leads a strategy policy for Credit Bureau functioning.

The concept of the Credit Bureau organization is that the central data base is placed within the association of Serbian banks but it is organized in such a way that each bank has its own space within the central data base and is solely responsible for maintenance and correctness of data (Figure 2). The banks are restricted to access only to their own data. When the request for a specific client is being issued the appropriate procedure is commenced.

Each separate part of the bank's data base is searched based on this procedure and the overall report is being issued.

From the organizational point of view there is a partnership between the banks and the Credit Bureau in this business. The banks are giving up-to-dated data and draw the reports, and the Credit Bureau maintains data base and channels of communication. The good side of this kind of organization is that every counter in any bank or affiliate is the counter of the Credit bureau at the same time, because one may get the report based on defined

rules at any place. The main motif for the banks to give their counters to the disposal of Credit Bureau is the division of profit between the banks and The Association of Serbian Banks. This gives the excellent relation between the number of employees (less than twenty) and the quantity of entered data and the number of available reports. The Association of Serbian Banks is the organizer and the holder of Credit Bureau's businesses in Serbia and the software made by Serbian IT industry is used. This software was developed by Belit and E-Smart companies. Usually at the end of a working day, the banks automatically start specific procedures or jobs where procedure calls are placed in. These procedures draw out the data from the bank's production base and place them in the appropriate text files in a computer folder which is specially envisaged for forwarding data to the credit bureau. The documents for data exchange between banks and Credit Bureau informational system are in XML format. They are electronically signed and encrypted. Data safety is implemented through electronic certificates on smart card (the level of protection is equivalent to data protection with electronic payment operation). The protection is done through encrypted (SSL) protection level, which enables full data transfer safety, as well as the access only to the authorized persons to data base (two-stage authorization and authentication).

Due to the fact that all XML documents that are being forwarded to Credit Bureau pass through a certain validation, those documents which do not comply with XML scheme, are not being accepted into Credit Bureau Informational system. The documents which pass validation are being certified and forwarded to Credit Bureau through net web service on the internet or by modem connection through RA (Remote Access) server of the association of Serbian banks (ASB). Those data are placed in private bank sector which is a data base rented by a bank in ASB. If the information about the credit entity contains agreement information, data from the private bank space is automatically matched with the data from other banks and uploaded in the report data base. At that moment the data is accessible and the information can be seen in credit report. If the forwarded data is not automatically matched with credit client for any reason, the data is being manually processed and the reason why the system was unable to process this data is being identified. Credit Bureau holds in its data base all the information from a credit past in a period from two to five years.

Using reports of client solvency is the creditor's bank obligation at the conclusion of loan agreement. In the period of two years after the introduction of the credit bureau institution for natural persons, and one year after its implementation for economic entities, The Central Bank of Serbia becoming aware of the quality of the data contained in credit bureau reports, and proceeding from the need to control the classification of clients by banks,

prescribed obligation of banks to attach the report from the credit bureau in the file of every credit line applicant. This, besides the above mentioned clients classification control eliminates the possibility of selective approach when making a credit decision and the overall data used for statistical reports is enabled. This obligation is in accordance with the directive of European Parliament and The Council for Harmonization of Regulations of the Member States. It is regulated by this directive that before the contract on consumer credit is concluded, the creditor evaluates with all means available, whether the credit applicant regularly pays its obligations under previously approved loans. This would be the first development phase according to the Credit Bureau development plan. The second phase would include data from the ministry of the interior, Public Utilities Company, electric power Generation Company of Serbia (EPS), telecommunication companies, municipal courts, tax administration and other institutions.

Having in mind the quality of the Credit Bureau The Central Bank enacted the protocol of cooperation with SCB which is not limited to this institution only, but may be applied to any new institution of this type which may emerge on the market, providing that it acquires the status of qualified institution, meaning to have a specific number of users in their data base and a specific number of issued reports.

Types of reports

The requests to Credit Bureau for obtaining and use of reports on solvency of banking customers can submit bank and other creditors, such as trade and service organization, if members of the Credit Bureau and also the person to which the report relates. Attached to the request users are obliged to present prior consent of the person to whom the report relates. There are four groups of data in the report: identifying data about the person in question (name, surname, address, personal ID number, ID card number, social status), the total charges on loans, the amount of unauthorized overdraft on the current account, payment cards and due and unpaid credit.

Under the request of a bank or other creditor Credit Bureau issues: Basic report for natural persons/legal entities, synthetic report for natural persons/legal entities and group report for placement classification of natural persons/legal entities (Table 1). It can also issue one of these reports for the sureties or borrower's members of a household. At the request of natural persons or legal entities Credit Bureau issues a personal report, and on the special requests of the bank the additional report. The bank is obliged to draw at least a synthetic report for the loan applicant if the loan amount is equal or less than 100,000 dinars and the basic report if the loan amount is higher. The bank cannot draw any report without prior consent of the natural person or authorized

Table 1. The statistic of report issuance of Serbian Credit Bureau (SCB) by types during the period of 2004-2008.

Type of report	Clients category	2004	2005	2006	2007	2008	Sum
Basic report	Natural persons	39.153	687.859	1.206.876	1.903.293	2.350.074	6.187.255
	Economy clients	/	/	43.693	172.789	205.492	421.974
Basic report with scoring	Natural persons	/	/	16.557	21.831	37.826	76.214
Synthetic report	Natural persons	25.456	409.313	388.718	398.744	216.020	1.438.251
	Economy clients	/	/	7.996	43.097	30.258	81.351
Summary report	Economy clients	/	/	105	333	208	646
Personal report	Natural persons	597	9.296	36.778	69.301	32.814	148.786
	Economy clients	/	/	189	829	1.348	2.366
Control report	Natural persons	/	257	9.395	26.585	94.729	130.966
	Economy clients	/	/	692	4.486	7.547	12.725
Group report	Natural persons	/	/	/	7	478	485
	Economy clients	/	/	/	/	36	36
Sum	Natural persons	65.206	1.106.725	1.658.324	2.419.761	2.731.941	7.981.957
	Economy clients	/	/	52.675	221.534	244.889	519.098

person in legal entity. Certain forms exist for this purpose: Consent for obtaining the report from Credit Bureau and the request for the issuance of the report. Natural persons or legal entities may submit the request for obtaining the personal report to a counter of any bank or to Credit Bureau directly. Request for obtaining the additional report the bank may issue only for its clients and solely for those who gave their consent for drawing the report from the Credit Bureau. The report, at a special bank re-quest, may contain specific information of importance to the bank. Contents, deadlines, and the way of delivery to the bank are specified by the agreement with the Credit Bureau. In the Credit Bureau practice up to now these bank requests have been mostly for the purpose of the status data of their clients with other banks.

Once a month credit bureau generates the following summary reports:

(1) Debit statement at bank credits and due to unpaid obligations, (2) Debit statement at credits of government funds and agencies and due unpaid obligations, (3) Debit statement at leasing contracts and due unpaid obligations, (4) Current accounts of legal entities, natural persons and entrepreneurs, (5) Debit statement at credit cards and due unpaid obligations, (6) Debit cards, (7) Debit statement at potential obligations and due unpaid obligations, (8) Debit statement at interest-bearing securities.

The users of this type of Credit Bureau reports are banks which use them for their own analysis and creation of commercial policies, The Central Bank of Serbia for monitoring effects of monetary and credit policies, marketing agencies and institutes such as IMF and ASB for

and bank services.

Value-added services

In the scope of services that produce added value for users of services of credit bureau there is a wide range of various products and services which, based on the processing of raw data about clients credit activity, may considerably help creditors to make an adequate credit decision, to enable better profiling of users, to prevent fraud and even to facilitate the collection of disputable receivables. The range of services that make added value is extensive and usually covers the following services: (1) Marketing services, (2) Credit scoring, (3) Portfolio monitoring, (4) Fraud detection, (5) Collections, (6) Application processing.

For the time being Credit Bureau in Serbia in its offer of value added services has credit scoring service, application processing services (portal and survey of credit bureau) and portfolio monitoring service which is in its final stage of implementation. Having in mind that the Credit Bureau in Serbia began its business operations only 6 years ago, the level achieved and the number of services that produce added value can be rated as very successful, and taking the organizational-technologic base into consideration, which is at credit bureau disposal, it is realistic to expect implementation of new services in the future.

Serbian credit bureau model uniqueness

Serbian credit bureau model has a set of various

Table 2. The number of queries to the system by different user category in 2008.

User category	No. of query
Natural persons	2.731.941
Entrepreneurs	97.086
Legal entities	147.803
Sum	2.976.830

functional characteristics which may be systemized in the following way:

(1) Technically, model represents an original solution. Banks and other institutions which forward data about credit debits of citizens and economic entities to credit bureau import them in rented private data bases in the credit bureau information system. The access to this data bases is restricted only to the authorized persons in banks and other institutions and credit bureau may only have the access in the case of written consent of natural person or legal entity for which the report is being requested from the credit bureau. Only that the bases may be accessible, credit bureau forwards the request, data is matched and the report is being generated.

(2) The second characteristic is promptness which may be reflected in the fact that data is being imported in rented private data bases of banks and other institutions on daily bases.

(3) Institutions that import data in private data bases are solely responsible for data accuracy that is being forwarded to credit bureau. Application of semantic, syntax and logic rules for checking data has a purpose to disable storing data which do not satisfy defined criteria in data bases in the credit bureau information system. The speed of data import combined with their accurateness considerably affect the satisfaction of credit bureau service users enabling them to bring adequate credit decision based on reliable information.

(4) A good complaints system that is based on constant monitoring of banks and other lenders by the credit bureau with the aim of resolving claims relating to the accuracy of the data displayed in the reports of credit bureau as soon as possible. Request for data correction may be submitted by service users, service providers and credit bureau. The institution which has imported data in the rented private space is responsible for complaints and for carrying out necessary changes. Time for dealing with complaints is restricted on 3 days.

(5) The organizational scheme of credit bureau is based on the use of the member banks branch network. This enabled credit bureau to establish the network of 2,500 locations where the users can get all the information and services from the domain of credit bureau, "over the night". Thus the significant operational expenses for establishing own branches on the territory of Republic of Serbia have been eliminated. Economic meaning of this

symbiosis consists in the fact that for each charged fee for issuing report from the credit bureau, bank receives 40% of the total sum.

Comprehensiveness is achieved by gathering all banks (35) and leasing companies (17) in Serbia in credit bureau system, which means that they have to forward data about credit activity of natural persons and legal entities by the prearranged dynamic. This considerably influences data quality which creditors receive from the credit bureau and based on this they bring credit decisions. The situation, which exists in some countries that credit user, due to the fact that not all the creditors are stored in the credit bureau system, is granted a loan besides the fact that he may have bad credit history at some bank which do not forward data to credit bureau, is being prevented.

(6) Credit bureau records positive and negative data about credit activity of natural persons and legal entities. The survey of The International Finance Corporation (2006) showed that 68% of credit bureaus keep positive and negative data about natural persons and 50% of them keep positive and negative information about legal entities. The same survey suggests that the clients credit capability evaluation based on positive and negative information about credit activity leads to reduction of the default rate of 43% related to the situation when the credit evaluation is based on negative information solely. McIntosh and Wydick, (2004) conclude that sharing of positive information helps to mitigate borrower over-indebtedness, lower default rates in the overall credit market and (in competition) to reduce equilibrium interest rates.

PERFORMANCE EVALUATION OF CREDIT BUREAU IN SERBIA

Evaluation of credit bureau performances may be done in different ways. For the purpose of this paper the performance evaluation of credit bureau in Serbia is made in accordance with International Finance Corporation (2006) methodology, which implies the set of indicator analysis in the specific time span. This time span is related to the year when credit bureau in Serbia started to operate with its business in 2004 until 2008.

(1) Quantity as an indicator of successfulness of credit

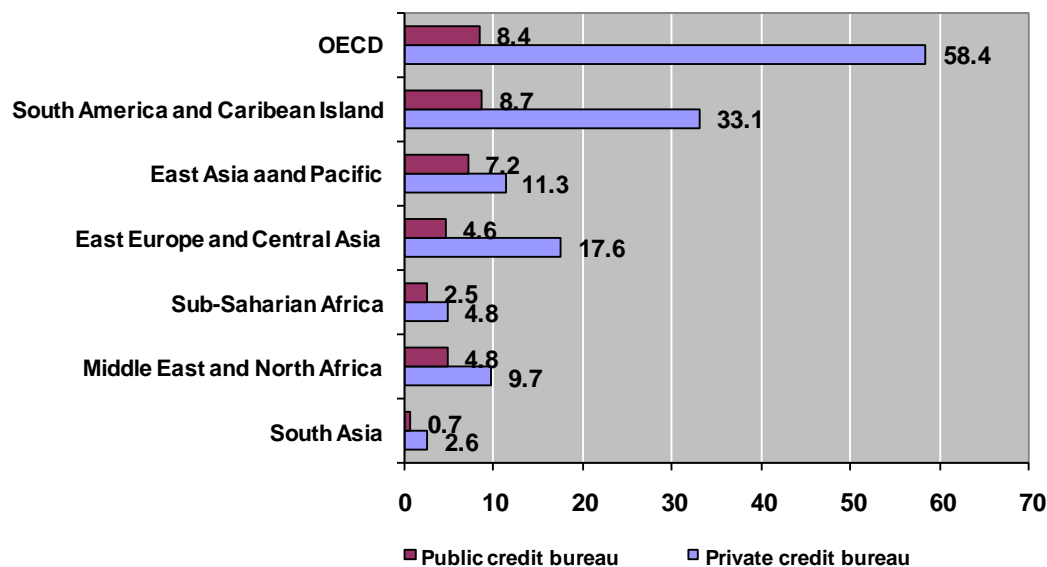


Figure 3. The relation between credit placement and the number of queries to the system 2004-2008.

Table 3. The number of issued reports for different user category in 2008.

User category	No. of report
Natural persons	2.731.941
Entrepreneurs	97.086
Legal entities	147.803
Sum	2.976.830

bureau operations shows physical scope of services which the credit bureau delivered to its service users in a specific time span. The relevant aspects of this element for credit bureau performance evaluation are:

(a) Number of queries received by the system from the credit bureau service users. This parameter is the key measure of the users demand for credit bureau services. In most cases the query is submitted by creditors, in order to make an adequate credit decision on the bases of the report given, but in some cases the query is submitted by natural persons and legal entities so as to check their status in the credit bureau. Data about the number of queries to the system under the credit bureau in Serbia is shown in Table 2.

Since the credit bureau reports are integral part of the documentation for loan granting, by the decision of The Central Bank of Serbia, the number of creditor queries is in a direct relation with the growing credit demand. Figure 3 which display the total credit placement and number of queries to the system in a period from 2004 until 2008, confirms this correlation.

(b) The number of issued reports is one of the most important key output measures of credit bureau operation successfulness. Increased number of issued reports is in direct relation to the increased number of queries made

to the system. Table 3 shows data about issued reports from the credit bureau in Serbia during the 2008 for specific user category.

Hit ratio is defined as the ratio of the number of issued reports and the number of queries received. This parameter enables credit bureau to fulfil the creditors' need for relevant information which their credit decision will be based on. In the relation between the number of issued reports shown in Table 3 and the number of queries made to the system, shown in Table 2, it has been determined that the hit ratio is 1, meaning that the credit bureau in Serbia has replied to creditors request to issue the credit report in 100% cases. This is the result of technological sophistication of the credit bureau in Serbia which gives no possibility of a failure to issue valid credit report if the query is submitted with respect to operational rules, which means by written consent of legal entity or natural person in question.

The number of users in the credit bureau data base shows credit bureau coverage ratio. This indicator can be viewed analytically through each user category (natural persons and economic entities).

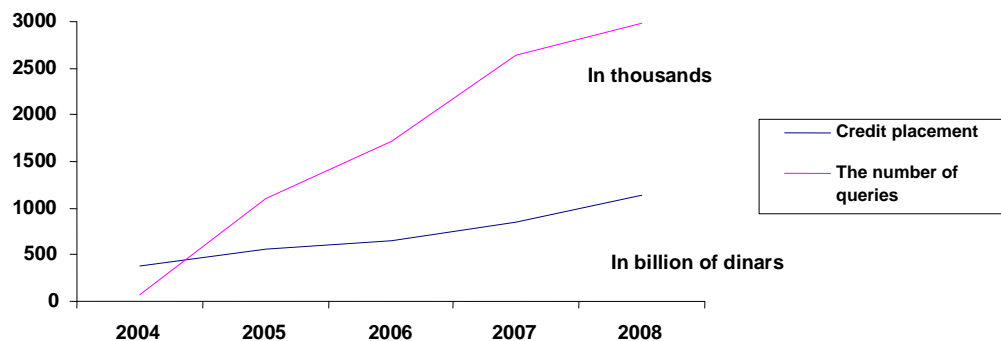
According to the data shown in Table 4 in credit bureau data base in Serbia there are data for 5.494.410 citizens of Serbia which is 74,39% of population.

Table 4. Statistical data survey about population and economic entities in Serbia.

Population and economic entity	Value
Number of population in Serbia	7.385.826
Number of adults	5.978.684
Number of registered economic entities	329.462
Number of users in CB data base – of natural persons	5.494.410
Number of users in CB data base – of economic entities	600.000

Table 5. Private and public CB coverage ratio of neighbouring countries.

Country	Credit bureau type	Year				
		2004	2005	2006	2007	2008
Serbia	Private	0	0	43.40	51.30	91.90
Croatia	Private	0	0	0	72.40	71.80
Slovenia	Public	2.50	2.70	2.90	2.50	2.70
Bosnia and Herzegovina	Private	15.60	19.30	22.90	63.70	69.20
Montenegro	Private	0	0	0	0	26.30
Macedonia	Public	0.6	1.90	2.10	4.0	6.50

**Figure 4.** Coverage ratios of private and public credit bureaus by the regions.

Due to the fact that part of the population under 18 is not liable to apply for credit lines of banks and other creditors, the data on the relative number of individuals for which there is data in the database of credit bureau and the number of the adult population is important for analyzing and determining the coverage ratio of credit bureau. According to The World Bank methodology it has been suggested when computing coverage ratio to take into consideration only adult population. Coverage ratio for natural persons is calculated by formulae

$$CR_n = (CBUn / Na) \times 100$$

where, CR_n is coverage ratio for natural persons, $CBUn$ is the number of users (natural persons) in credit bureau data base and Na is the number of adult population. Credit bureau coverage ratio for economic entities may

be calculated by the relation between the number of active economic entities on whose credit activity credit bureau keeps record and the gross number of registered economic entities in one country's market. In the conditions of credit bureau in Serbia the calculation of this ratio is restricted due to the fact that the data about economic entities in the credit bureau data base in Serbia are kept in the period of 5 years after termination of the contractual obligations. In such a long time span a great number of economic entities cease to operate, but the credit bureau still has the data about their credit activity. As the figures in Table 4 show in the credit bureau data base in Serbia data is kept for about 600 000 economic entities, and the number of active economic entities on Serbian market is 329.462. This undoubtedly shows that the credit bureau also keeps data about inactive economic entities among the registered economic entities who

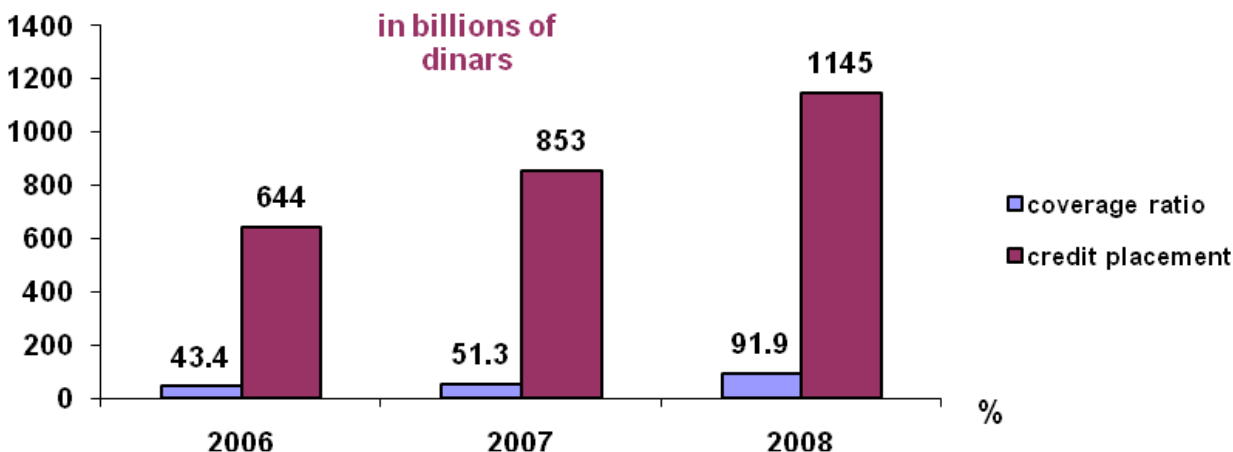


Figure 5. The relation between the credit placement and coverage ratio of the CB in Serbia.

Table 6. The methodology used for determining credit score depending on the number of bank services.

Number of bank service	Score
1	50
2	40
3	0
4	20
5	30
6	40
>6	50

actually neither operate nor use creditor's credit lines. Based on the data stated by The World Bank (2009) about the coverage ratio of private and public credit bureaus for the surveyed countries, Figure 4 shows the average coverage ratio for natural persons of private and public credit bureaus by the regions.

In many Asian and East European countries establishing the credit bureau institution was followed by delays in updating data in the credit bureau data base and issuing reports, which partly explains the low coverage ratio in these countries. The second reason lies in the fact that the active credit population is very low in percentage in relation to the gross population in these economies. Relation between the number of users and the number of adult population that has been entered into the credit bureau data base in Serbia for 2008 (Table 4) showed that the coverage ratio in Serbia was 91.90% thus placing it among the ones with the highest coverage percentage. The International Finance Corporation (2006) suggests that the higher credit activity in a national economy is the higher coverage ratio of credit bureau will be. Serbian example may be presented in the following way. As it can be seen from Figure 5, the credit activity increase have been followed by the increase

of credit bureau coverage ratio in Serbia thus proving the positive correlation.

For the purpose of this analysis it may be interesting to point out to the coverage ratio of private and public credit bureaus of the former Yugoslavia's republics, because of the similar socio-economic and political context. Table 5 shows the historical movement of the coverage ratio in the period from 2004 – 2008 for the former Yugoslavia republics.

In Section 2 of this paper it has been pointed out to the advantage of the private credit bureaus in contrast to the public one. Based on the data shown in Table 5 it can be stated that besides the advantage which the private credit bureaus have in contrast to the public credit bureaus there is also the advantage in relation to the coverage ratio.

(c) The number of records in the system in a specific time span shows credit habits of natural persons and legal entities, and it points out to different credit lines used by both user categories. This parameter for measuring credit bureau performances is important due to the fact that it enables credit bureau to meet the demands for statistical use of creditor services on one hand, and on the other hand, these data are used when determining the credit

Table 7. Analytical survey of the number of records in SCB data base.

Natural persons		Entrepreneurs and legal entities	
Name of service	Number	Name of service	Number
Current account	7,300,000	Current account	1,118,000
Debit card	4,927,000	Credit and leasing contracts	618,000
Credit card	1,724,000	Guarantees	117,000
Credit and leasing contracts	2,628,000	Irrevocable letter of credit	8,500
		Avals	4,000
		Discount securities	2,500
		Credit cards	In preparation
		Foreign credits	In preparation
Sum:	16,579,000	Sum:	1,868,000

score. In the case of credit bureau in Serbia, when determining user's credit score, depending on the number of bank services in use the following score is awarded to him according to Table 6. Based on the data shown in Table 6 it can be concluded that the best status when use 3 bank services (the score is 0).

It is impossible to predict the future behaviour of those clients who either use less bank services than that or do not use them at all. On the other hand, a great number of bank services that one client uses may be an indicator of his financial difficulties and that by borrowing with one bank he discharges his duties with other creditors. For this reason this user category gets the higher score.

Records about users' credit activity placed in the credit bureau data base in Serbia are kept separately for natural persons from those of the entrepreneurs and legal entities (Table 7.)

The relation between gross number of records about credit activity of natural persons shown in Table 7 and gross number of natural persons whose data is being stored in the credit bureau data base shows that the average adult citizen in Serbia uses 3 bank services. In the context of the entrepreneurs and legal entities the presented data suggest that one economic entity in Serbia uses 3 bank services in average as well.

Every credit bureau tries to increase its coverage ratio and hit ratio. Credit bureau performance analysis, in the context of its services, is based on the simultaneous evaluation of both indicators. Isolated observation of each of these indicators does not provide a complete insight into the credit bureau operation, and consequently the character of the financial system. For example, hit ratio may be low for a credit bureau that has low coverage ratio. This kind of situation indicates undeveloped credit market where creditors have a few clients. Based on the facts of credit bureau quantitative characteristic analysis in Serbia, hit ratio 1 and coverage ratio of 91.90%, it may be concluded that the credit market in Serbia is developed and that credit bureau in organizational-technological

sense is capable to provide its clients with up to dated and valid information on which adequate credit decisions will be based on. These characteristics make credit bureau in Serbia one of the best in the world.

(2) The quality, as a category for credit bureau performance evaluation is manifested as accuracy, currency, completeness and consistency of bureau's data. Validity of information that credit bureau distributes to its users is directly influenced by their accuracy and currency. The relevant quality indicators are:

(a) The number of complaints on the data accuracy shown in the credit bureau reports is a considerable indicator of credit bureau capability to solve them in a short period of time, thus influencing directly on the quality of information available in the data base. It is necessary for a credit bureau to have developed system for receiving complaints and monitoring of their solving. Credit bureau model in Serbia is established in such a way that the creditors themselves import credit activity data of natural persons and economic entities in the private data bases in the credit bureau information system. In such a way the full responsibility for accuracy of imported data, which the credit bureau generates its reports on, is fully transferred to creditors. In case that the credit report contains the data which are inaccurate in the opinion of credit users, they submit an application for correction to the creditor who is responsible for its solving. The application for correction beside users may be submitted by creditors as well as the credit bureau itself. The time for solving the complaint is restricted by operational rules to 15 days, but in practice this period is between 25 and 48 hours depending on data type and the complaint application that has been submitted. The creditors are under the obligation to forward the complaint application, no matter who the submitter is, to the credit bureau. Credit bureau monitors the solving of complaints and forces the creditors to solve them in due time. In current credit bureau business practice in Serbia on issued

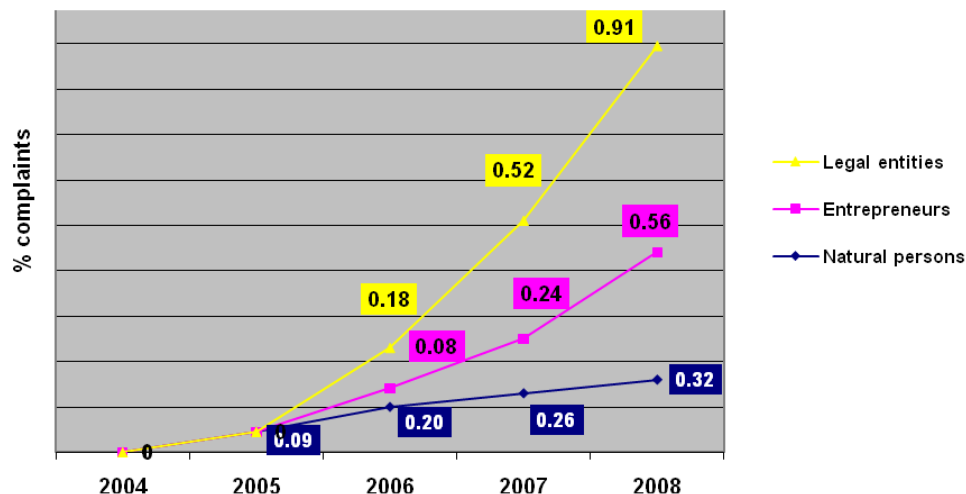


Figure 6. The number of complaints in percentage from the gross number of SCB reports in the period 2004-2008.

reports there has been 22,147 reported complaint which is 0.26% of the gross number of issued reports. Figure 6 shows the number of complaints as the percentage of the gross number of issued reports by separate user categories in the period 2004-2008. Complaints have a tendency of growing yearly which directly correlates with the number of issued reports (Table 3). It is evident that the percentage of complaints on the reports generated by the credit bureau for legal entities has a slightly growing tendency according to the issued reports in contrast to other user categories, which is a direct consequence of the fact that the creditors forward data for a great number of individual credit lines to a credit bureau for this type of users, (Table 8).

(b) Percentage participation of the number of complaints according to the data accuracy shown in the credit bureau reports where the inaccuracies has been made due to the actions of the credit bureau indicates the quality of credit bureau working process

In most cases complaints are the result of inaccurate data forwarded by creditors, but there are some cases when the cause is a failure in credit bureau work process. It is in credit bureau interest to decrease the number of such complaints as much as possible considering the fact that its credibility with end users is directly related to the cause of the credit bureau unique structure in Serbia this kind of situation is impossible.

The creditors are exclusively responsible for the accuracy of the data presented in the reports of the credit bureau. During the report generation credit bureau makes an access to the report data base where the matched data from the other creditors' private data bases are placed into. Any possibility for the credit bureau to make an access to the private data bases and to change data in any way has been eliminated. This fact is crucial because it contributes to creating a respectable image of the institution.

(c) Data quality reports in the credit bureau system have the aim to analyze completeness and consistency of data. By using the unique identifiers (IDs, address, date of birth, personal identification number and similar information) the incomplete and duplicate files in the system are being identified. High quality of available information in credit bureau information data base in Serbia is provided by the use of data validation rules. The plan for the future is to perform a study that should indicate the percentage of incomplete and duplicate files in the system and errors of any kind which occur in credit bureau reports. Credit bureaus of the world's most developed economies are not immune to this phenomenon which has been proven by the research conducted in the USA (National Association of State PIRGs, 2004) based on the sample of reports from the three major credit bureaus in the country Experian, Equifax and Trans Union. The research results point out the fact that from the total number of samples 79% of report contained some kind of data irregularity, while 22% of reports contained duplicated data.

(d) Number of files that creditors submit to a credit bureau, containing data about user credit activity, which have been rejected at reception due to the fact that they have not met the rules for their consistency evaluation, is an important indicator of credit bureaus efforts to perform quality monitoring of data which are available on the market. In the case of the credit bureau in Serbia the quality and consistency of data that creditors import in the private data bases is provided using the syntax (98) and semantic (163) rules for data validation. Importing files into the rented private data bases by creditors is disabled if files do not meet the rules of validation, which ensures high quality of information on which credit bureau generates reports. The quality of services as a category for performance evaluation of credit bureau business operations represents the most important aspect of creating

Table 8. The relation between the number of issued reports and received complaints for different user category in the period of 2004-2008.

User category	Number of issued report					Number of complaint				
	2004	2005	2006	2007	2008	2004	2005	2006	2007	2008
Natural persons	65,206	1,106,725	1,658,324	2,419,761	2,731,941	/	1,037	3,314	6,315	8,618
Entrepreneurs	/	/	20,025	88,188	97,086	/	/	16	212	545
Legal entities	/	/	32,650	133,346	147,803	/	/	59	693	1,338
Sum	65,206	1,106,725	1,710,999	2,641,295	2,976,830	/	1,037	3,389	7,220	10,501

and preserving the credibility of the credit bureau from the perspective of its users. This element directly affects customer satisfaction, and thus the financial performance as the basic prerequisite of successful business. Serbian Credit Bureau (SCB) is capable to offer its users high quality of services considering the number of received complaints about the correctness of credit reports (below 1%), by using the applied technological solution which eliminates credit bureau error possibility when manipulating the data and using the rules for validation of data forwarded by creditors. Judging by these characteristics Serbian Credit Bureau may be placed among the world's best credit bureaus. The element that is missing is an independent study of quality which empirically has to prove this statement.

(3) Timeliness as a category for credit bureau performance evaluation is generally measured by the time

necessary for obtaining the report from the credit bureau. It consists of the following elements:

(a) Time between obtaining the query and issuing the report is considerably different from one credit bureau to another. The results from the research conducted by the World Bank (2004b) on the sample of 78 credit bureaus show that report issuance was enabled in 57% cases in real time, in 37% of cases the credit report is issued in the

period of 1-7 days, in 3% cases in the same day, and in 3% cases it was necessary between 7 and 30 days. (Figure 7) The average time for obtaining the credit report in Serbia is 5-7 s which places the credit bureau among the first category credit bureaus in the world (57%).

(b) The time necessary for the integration of data received from the creditors into the data base is an important indicator of credit bureau capability to offer up-to-dated information to its service users. Depending on the credit bureau this period may vary from a couple of hours to one month. The time necessary for data integration may be influenced by many factors, among which the most important are the quality of information originating from the creditor, reliability of unique identifiers (ID number, the address, personal ID number) and sophistication of the information system. In Serbia the time necessary for data integration into the credit bureau data base is measured by hours. More precisely, the creditors at the end of the working day until 10 p.m. forward the data into private data bases under the credit bureau information system. The data are being integrated during the night and they will be available for credit reports starting from the 7 a.m. the following day.

(c) The timeliness category includes the time necessary for removing errors from the data base by creditors or credit user's complaints. The

survey mentioned above conducted by The World Bank (2004b) shows that from 78 credit bureaus surveyed, 76% stated that they needed less than 2 weeks to correct the errors in the data base.

The additional 8% stated that they needed between 2 weeks and one month for data correction. The credit bureau model in Serbia which implies that the creditors are responsible for accuracy of imported data also assumes that the correction of data in the data base is their responsibility. Credit bureau monitors the process of error correction and forces creditors to do so within the stipulated time (with no longer than 15 days). In practice this period is between 24 and 48 h. From the point of time frame Serbian credit bureau is characterized by high-performance. The time necessary for report issuance, data integration and error removal is at the level of the world's best credit bureaus. (4) Financial performances of the credit bureau can be measured by the standard set of indicators such as return on equity, profit margins, operational costs, but for the needs of this analysis it is important to point out to the specific indicators for the financial performance evaluation: (a) Profit margin per product line is an indicator which has to show the different levels of profits for different types of services which credit bureau provides to its customers. For example, credit bureau may sell a raw material to its users at the expected

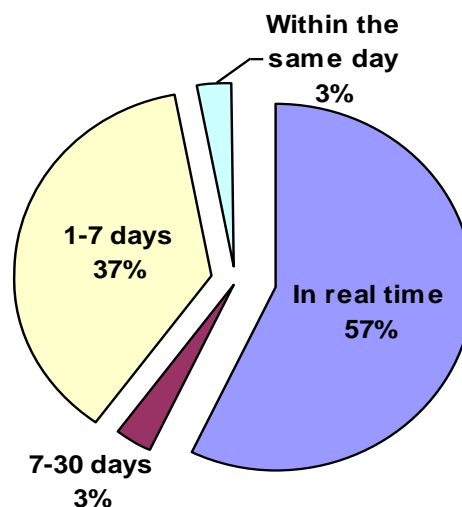


Figure 7. Time necessary for credit report issuance after the received request.

Table 9. The structure of fees that SCB collects from its users.

The user category	Service name	Price (€)
Natural persons	Basic report	2.20
	Synthetic report	1.50
	Personal report	2.40
	Additional report	By request
	Revised report because of Clients refunds	Free of charge
Entrepreneurs	Basic report	5.30
	Synthetic report	3.20
	Personal report	6.40
Legal entities	Basic report	12.80
	Summary report	10.60
	Personal report	19.90

lower price or it can offer them analytically processed material, such as credit scoring, at higher price. The price policy of the credit bureau in Serbia is in accordance with different types of services that this institution offers to its users (Table 9). The additional services such as credit scoring, portal and credit bureau survey are not charged separately, and for the portfolio monitoring service (which has not been implemented fully) the price policy has not yet been determined. It is evident that two parameters have been used when defining the credit bureau price policy in Serbia: the types of reports and user category for which the credit bureau generates the report. When the type of report is being taken into consideration, the charge amount is being defined depending on the level of analytical data

processing. In such a way the basic reports, for all user types, characterized by the detailed survey of users' obligation on highest rate. When defining the charge amount for this type of report not only has the level of analytical data processing taken into consideration but also the fact that credit line users ask for this type of report themselves. Based on the data shown in Table 9 it is evident that from all types of users legal entities are charged at highest rate. (b) Profit margin per client is an indicator which thorough analysis enables credit bureau to define precisely its price policy. In order to attract major creditors credit bureaus often have a practice to give them considerable volume discount according to the number of reports drawn. Banks and leasing companies that are in the system of credit bureau

in Serbia do not have this kind of privilege due to the fact that when charging end users a fee for drawing report from the credit bureau they get the amount of 40% for natural persons and 20% for economic entities. This kind of distribution of compensation between credit bureau on one side and banks and leasing companies on the other has to cover operational expenses of using bank branches and leasing companies as credit bureau branch-office and to stimulate the major creditors to achieve the scope of drawn reports as much as possible. Model of price policy, which should encourage creditors to achieve the larger volume of credit bureau services in order to achieve discounts, is applied in the case of mobile operators. The contract between the Association of Serbian Banks and mobile operators anticipated that operators may have a 25% discount within 1 calendar month if they draw a greater number of reports. By a greater number it is assumed at least 10 000 reports for natural persons, 200 for legal entities and 150 for entrepreneurs.

The price policy of SCB is made in such a way that for the major creditors (banks), who are at the same time the founders of a credit bureau, the selective approach in collecting the compensation in the sense of a discount at the higher scope of drawn reports is not being applied. Such price policy has been applied in the case of mobile phone operators. From the SCB point of view the price policy has been diversified depending on the type of reports and the user category.

(5) The last parameter for credit bureau performance evaluation is user satisfaction. International Finance Corporation (2006) suggests that this factor for credit bureau performance evaluation should be viewed in a context of two elements:

(a) The number of complaints is an indicator that has been thoroughly explained in the section of this paper which deals with the quality of service of the Serbian credit bureau. By identifying the complaint requests that originate from creditors and those who originate from the credit line users it is possible to additionally upgrade the information quality which is in the disposal of credit bureau. In the business practice of the SCB the natural persons and economic entities can apply for complaint based on the data from Personal report and Control report. The application is being dealt with by the procedure described earlier and after that the report from the credit bureau is being issued to the applicant free of charge in order to point out to the result of resolved complaint. The satisfaction of credit line users has been considerably influenced on by this kind of business policy, and consequently to the creditors satisfaction through the improvement of quality of available information in the credit bureau data base.

(b) The average time for resolving complaints has been explained in full detail in the section timeliness as a criterion for credit bureau performance evaluation. Shorter

time necessary for resolving complaints has a direct influence on increasing timeliness of the information the credit bureau deals with, and by that the credit bureau users satisfaction. As one of the ways to improve this factor of credit bureau business process The World Bank suggests the implementation of help desk where the clients would be able to solve complaints in direct contact with the credit bureau representatives. However, this way of resolving complaints is inconvenient because additional staff is needed thus causing higher costs of the administration. For credit bureaus which are directly responsible for data accuracy shown in the credit reports, the help desk is probably the best possible solution for cutting the average time of complaints solving short. In the case of SCB, who bases its business logic on the sole responsibility of creditors for the data accuracy, there are more sophisticated and economically cost-effective ways for cutting the time of complaints solving short, and thereby increase customer satisfaction. The time for complaints solving may be from 24 to 48 h. In the case of data error which creditors on regular basis forward to the credit bureau it is necessary 24 h for the correction of the same. When creditors spot the error in the data which they have been forwarded to the credit bureau, at the end of a business day in the file imported in the private data base they send the corrected data which overwrites the data previously written. The corrected data is available in the credit bureau report the very next day. If the error in the historical data which are placed in the credit bureau data base is in question it is necessary 48 hours to correct it. In one business day the complaint is being submitted and then being forwarded to the credit bureau and on the following day the data being corrected by the creditor is written in creditor private data base under credit bureau, by rewriting the old incorrect data. Also, on the following business day the corrected data is available in the credit bureau reports.

The importance of this factor for the credit bureau performance evaluation is very high due to the fact that it unites all criteria previously mentioned, that is the quantity and quality of services of the credit bureau, timeliness and financial performances which have decisive influence on users' satisfaction and enable the existence and prosperity of the credit bureau.

Conclusion

The survey, whose results have been shown in this paper, has a purpose to point out to the specific business model of credit bureau in Serbia and high performance of its operation. The conclusion can be systemized in the following way. Firstly, credit bureau in Serbia is the best example of how the functional solution for managing credit indebtedness of citizens and economy may be developed relying on personal resources. Serbian credit bureau model has been independently developed in

Serbia, with low initial investments, and it represents technologically advanced solution. The experiences of well organized credit bureaus in the world were used as an example, but they were upgraded and the latest technological solutions were implemented. This paper points out to the specific model of SCB, with the highlight on the unique structure of data import into the private data bases under the supervision of credit bureau.

Secondly, positive correlation between the level of credit bureau coverage (coverage ratio) and credit placements has been affirmed, which empirically proves the hypothesis published by the World Bank Credit Bureau Knowledge Guide that the higher the credit activity the higher the level of credit bureau coverage (coverage ratio).

Thirdly, it has been pointed out to the high level of SCB business performances. Credit bureau whose hit ratio is 1, coverage ratio 91.90%, whose data sources are all relevant financial institutions on the territory of Republic of Serbia (banks and leasing companies), the average time of report issue is 5-7 s, the percentage of complaints in the total number of issued reports is 0.26%, the average time of solving the complaints is 24 to 48 h, and who offers up to dated information to its users on daily bases, deserves a respectable image that this institution already have in the eyes of its service users.

The study should emphasize that the conceptual solution based on the partnership of banks and SCB enabled SCB to be present in almost all the counters of banks in Serbia. On the other side this way of doing business enabled SCB to have timely data base and low level of errors in files. The role of the Ministry of Finance and National Bank of Serbia in this project must be emphasized. Those institutions recognized the importance of introduction of credit bureau in Serbia which enabled, in cooperation with the measures of the Central Bank of Serbia, the control of credit indebtedness of citizens and legal entities in condition of credit expansion from 2003 until the present day. According to the latest data the credit debit per citizen in Serbia is 550€, placing it in much better position in relation to some other neighbouring countries where the expansion of

credit activity was not monitored by the introduction of the credit bureau institution or it was introduced too late. The best example is Croatia where the average credit debit per citizen is €3.700.

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