## **RISK CONTROL**

### Note

# **RC-Credit Scoring System**

Risk Control has devised an innovative software for creating and managing credit scoring models called RC-Credit Scoring System. The software allows users to build models in a structured way. This makes subsequent administration and maintenance straightforward and reduces the need for large quant teams.

The framework can simultaneously host multiple models (for example, for different segments of the market or for different markets). The software offers web services to other systems through which they can request credit scores for individual loans or portfolios.

Using this model, lenders and investors can develop their own scoring models rather than relying on off-theshelf vendor models. As is well-known, scoring is only useful if the sample employed in estimation closely matches the loans to be scored.

ISK CONTROL	😰 Upload 🛛 🛔 Data Prepa	ration II Model Estimation O Published Models		
Model: model_test_46				
Test Data 1	Variable Groups	Variable name	Select 🗌	View 🗌
	-	Cash flow To Current liability		
Estimation	All Groups	Growth Rate of Ratio 8 Cash flow To Current liabl		
	Adjustment	Adjustment Current assets To Total debt		
	4000000000	Growth Rate of Ratio 5 Current assets To Total de		
	Business Nature	Current liability To Equaty		
	Funding	Growth Rate of Ratio 9 Current liability To Equaty		
Model Status		Current ratio		
	Liquidity	Growth Rate of Ratio 2 Current ratio		
Model Creation	Growth Rate Equity and Long-term debt To Fixed assets			
Variaté Analysis Multi-Variaté Analysis Statistical Reduction Sign Reduction Normalisation Finalised		Growth Rate of Ratio 10 Equity and Long-term de		
	Media	Fixed assets To Equity		
	Qualitative	Growth Rate of Ratio 7 Fixed assets To Equity		
		Indicator of negative Retained Earning		
	Size	Growth Rate of Ratio 14 Indicator of negative Ret		
	Solvency	Inventary To Net working captital		
		Growth Data of Datio 3 Inventary To Net working r		100

### **RC-Credit Scoring System features:**

- Server-based and using JEE technologies, the system may be installed on client systems and accessed by users using standard browsers on any web-based device.
- The user may view tables and charts via the interface and download Excel workbooks containing the tables.
- At the core of the software is an XML document defining sequences of statistical modelling steps.
- These 'workflows' can be modified as required to support a range of different scoring methodologies without the need to rewrite the software.
- The approach is highly flexible and means that the software can easily host a wide range of credit scoring methodologies (or indeed predictive methodologies/models aimed at issues other than credit scoring such as prepayment).
- The software supports multiple scoring methodologies including a several "IRB bank type" logit-based models and machine-learning type approaches such as Artificial Neural Nets. Users may switch seamlessly between different methodologies in generating their models and generating credit scores.

The software offers several basic scoring methodologies. Using these analysts can build one or more models in a highly effective way without the support of developers or specialised quants.

Risk Control has also constructed downstream applications that request scores from the parent software application via REST services. These include a web-service enabled Excel client for portfolio analysis and a highly scalable Angular-JS application for counterparties or potential borrowers.

ISK CONTROL	Į	Dipload	di Data	Preparation	II Model Estimation	Published Models	Profile C+ Log
Test Data 1	Adjusted	Variables					
	De	efined Ad	justed Va	riables			
≡ Data			ID	Name	Definition	Display Name	Data Type
Preparation		8	4359	Ratio 1	ratio1	Quick ratios	DECIMAL
			4386	Ratio 10	ratio10	Equity and Long-term d	€ DECIMAL
Sefine Variables		8	4389	Ratio 11	ratio11	Retained Earning To To	t DECIMAL
& Variable Groups		8	4392	Ratio 12	ratio12	log(Total Assets)	DECIMAL
O Adjusted Variables		8	4395	Ratio 13	ratio13	Total Liability To Total A	s DECIMAL
		8	4398	Ratio 14	ratio14	Indicator of negative Re	t DECIMAL
Y Filter Management		8	4362	Ratio 2	ratio2	Current ratio	DECIMAL
Conditions		<b>B</b>	4365	Ratio 3	ratio3	Inventary To Net working	g DECIMAL
T Single Period Filters		1	4368	Ratio 4	ratio4	Net working capital To T	C DECIMAL
O Time Series Filters			4371	Ratio 5	ratio5	Current assets To Total	C DECIMAL
& Filter Chains		8	4374	Ratio 6	ratio6	Total debt To Equity	DECIMAL
			4377	Ratio 7	ratio7	Fixed assets To Equity	DECIMAL
			4380	Ratio 8	ratio8	Cash flow To Current lia	t DECIMAL
	1	8	4383	Ratio 9	ratio9	Current liability To Equa	t DECIMAL

### **Technical Information**

The RC-Credit Scoring System comprises three components that are mostly used in combination.

- 1. The **RC-Scoring Engine** component allows the web-based creation of rating models based on the application of statistical analysis to an existing portfolio. These models can be modified and re-evaluated until a model is finalised. These finalised models can be exported or published to subsequent components such as the RC-Scoring-Server. Results of each single step are visualised in charts and tables to allow detailed analysis of the results of all intermediate steps. Each step can be repeated with different parameters to identify the best performing values. All reports created throughout the model creation are persisted and can be recalled at any time.
- 2. The **RC-Scoring Server** component serves as a REST server for the evaluation of a scoring for provided data based on a particular rating model. To achieve this, the component accesses the published rating models from RC-Scoring Engine. To provide most flexibility for our clients, this component implements a REST-API which can be used by external software to evaluate scorings automatically.
- 3. The **RC-Scoring UI** component allows the web-based evaluation of scorings based on a set of input values. This component comes as a simple web application implemented AngularJS and allows the retrieval of scorings based on a particular model. All input parameters, which are defined by the model used, render an input field (or appropriate). As a response, the application displays the result in a configurable way, either in form of a traffic light or in more detail, according the amount of information the user is supposed to see.

The server software was realised with Spring-Boot and written in Java. The architecture allows the applications to run either as standalone applications or to be deployed in a microservice environment, which guarantees scalability, flexibility and reliability. The software uses a DBMS for data persistence and can be integrated in a client's environment by the support a wide range of databases such as Oracle, PostgreSQL, MySQL, etc.

Contact: <a href="mailto:sales@riskcontrollimited.com">sales@riskcontrollimited.com</a>