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JCIC's Services and Assistance for Banks in the Implementation of Basel II JCIC's Data Research Service Platform

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1. Introduction

Large internationally active banks possess certain advantages in the construction of risk management models. Large banks typically own an enormous and diverse database that covers a long period of time. On the other hand, as the use of credit risk management tools offers economy of scale and other incentives, large banks are less hesitant to invest more resources in risk management related research and innovation. In this regard, regional banks or small and medium-sized banks in developing countries are no rivals and can only play catch-up. The implementation of The New Basel Capital

Accord (Basel II) furthers the advantages of large multinational banks. Basel II incorporates the capital charge system that greatly reduces the capital cost of large banks and put small and medium-sized banks at a further disadvantage. Take the example of Internal Ratings Based Approach (IRB) proposed in Basel II, the construction and validation of risk model and the estimation of risk components- probability of default (PD), loss given default (LGD), the exposure at default (EAD) are based on accurate, comprehensive and relevant data. Banks that intend to adopt this more competitive capital charge approach must meet the minimum requirements.

The implementation of Basel II forces the financial institutions in Taiwan to face the harsh pressure of competing on an international level. But it also presents an excellent opportunity for them to rid of the traditional mode of operation and apply risk management techniques to adjusting investment portfolio and identifying niche market. Undeniably, domestic financial institutions have much to learn with regard to model building techniques. But the paramount problem they are faced with in the construction of internal rating model and quantification of risk components is the general and critical deficiency of internal data. The model building techniques and experiences can be imported in an accelerated fashion. But database building relies on the input of manpower and resources, procurement of hardware and software for data storage, extraction and analysis, formulation of data gathering plan, and step-wise progression and long-term accumulation. This is, the construction of infrastructure for IRB approach is not a readily attainable goal.

To deal with the problem of database building, some small and medium-sized banks (relative to large internationally active banks) in foreign countries propose the solution of

data pooling that calls for the construction of pooled database to address the lack of economy of scale in procuring hardware equipment and data scope. Nevertheless, data pooling and use of pooled database involve the sensitive and complex issues of commercial competition, customer privacy protection, degree of contribution to the pool, cost sharing, database management and maintenance, and responsibility for security control. As a result, the majority of data pooling initiatives were either bogged down or offered very limited scope following prolonged negotiation and comprise which were a wide departure from their originally intended purpose. The practicality of such pooled database remains to be seen, let alone providing any research and added value.

Joint Credit Information Center (JCIC) is the only national credit databank in Taiwan that has more than thirty years of history and is widely recognized and trusted. Its member institutions cover a complete spectrum of the finance sector. JCIC has accumulated comprehensive bank credit information for a long period of time, and has completed the construction of credit risk data warehouse. JCIC has also long been endeavoring in the research of improving the quality of credit risk

data and model quantification techniques. Based on the existing foundation with privacy protection ensured, JCIC imposes upon itself the jobs of helping member institutions to make more advanced use of its database and research results and helping them move toward more sophisticated and refined risk management.

2. JCIC's notions and practice in establishing the Data Research Service Platform

In the application of pooled database, data sharing and privacy preservation are two major issues that demand equal consideration. In light of the imminent implementation of Basel II and the needs for risk management, JCIC is under increasing pressure to share data. On the other hand, as consumers are more aware of their rights and legislative requirements for personal data protection become more stringent, data owners must be more prudent in data gathering and utilization. Under these circumstances, it is imperative for JCIC to establish a rigorous and viable data

protection mechanism that has the trust of the public and the principal parties in interest to achieve reasonable data sharing and help banks improve their credit management, thereby enhancing market stability, soundness and discipline.

The practices of the US federal government on information sharing and disclosure are based primarily on the Freedom of Information Act and the Privacy Act of 1974. A Federal Committee on Statistical Methodology (FCSM) and a Confidentiality and Data Access Committee (CDAC) were set up to draft the directives for data sharing and access¹ to be followed by some seventy federal agencies when they draft the administrative rules for data disclosure and sharing.

Information disclosed by US federal agencies could be classified into public use and project research use. For public use information (restricted data), federal agencies publish periodically statistical data and make microdata files available to the public following certain procedure and deidentification process based on the rules specified by FSCM

¹ Official reference papers published include: Statistical Policy Working Paper 22, Report on Statistical Disclosure Limitation Methodology(1994), Checklist on Disclosure Potential of Proposed Data Releases(1999)

and CDAC and after the approval of an internal Disclosure Review Board.

To access the data of a federal agency for project research purposes, a specific institution or academic organization may apply to the Research Data Center (RDC) of the federal agency under the Freedom of Information Act. The research institution must submit a proposal detailing its research purpose, plan, list of researcher, data needed, and security and control practices. After a rigorous disclosure review process, the researcher will be allowed access to certain data sets after signing an undertaking of confidentiality. In the aspect of information security and control, the actual practices of RDCs vary as the business nature and data sensitivity level of respective federal agency differ. Some RDCs, institute more relaxed access procedure. For example, the National Center for Education Statistics (NCES) allows researchers to take home the data if the researcher promises to work in a secure environment. However NCES is entitled to conduct unannounced inspection. The Census Bureau implements more stringent rules, requiring only on-site use

of its RDC and subjecting the researchers to strict security control.

JCIC uses the practices and standards of the US federal agencies as its paradigms. After consulting the views of scholars and experts on data processing and privacy protection and the advise of legal counsel, JCIC created the Data Research Service Platform and drafted the *Guidelines for Security Control Operation Involving the Provision of Deidentified Credit Risk Data for Research Purpose*² as its operating principles to provide credit risk data for use by member institutions for research purpose.

To access the JCIC Data Research Service Platform, member institutions are required, based on their needs (regardless whether the requested data are for statistical or research purpose), submit a research proposal and sign an undertaking of confidentiality. After the request is granted, the user unit or individual must go to a designated JCIC operational platform to access deidentified data in the JCIC database. The user must also comply with all information security and control rules of JCIC. Depending on the nature

² The Guidelines is available on JCIC website at www.jcic.org.tw

of the data accessed by the user, JCIC also carries out extra precautions and in-process monitoring, or might restrict the take-out and use of research results.

The practices of information disclosure and security control adopted by JCIC are more rigorous and prudent than the standards set by the US federal agencies. The reason for such precautionous approach is because the mechanism in place for providing data of this kind and privacy preservation is the first ever in the country. In the absence of any precedence, JCIC rather adopts high information security standards in the initial period of operation. It might cause some inconvenience to data users. But data security and privacy protection are more assured. JCIC will review the current data access mechanism after it is been implemented for a period of time.

3. Possible problems faced by banks in building credit risk models

Banks in general face two major tasks in the development of their IRB system: construction of rating system and quantification of risk levels. The major content of those two

tasks and possible problems faced in carrying them out are described below:

3.1 Construction of a rating system: The rating system is designed to rank all bank customers (or transactions) by risk level and assign each customer (or transaction) a risk grade. After analyzing the characteristics of good and bad customers, banks develop their own credit scoring model and use it to rank their customers by credit score, and then classify the customers into several grades (for corporate banking) or segments (for retail banking) in line with their risk management strategies and objectives. All customers in the portfolio may be classified under a certain risk grade or segment, and a credit or management policy should be in place for each grade or segment. However, banks might run into the following problems in the process of constructing such as credit scoring model:

- (1) Inadequate variable data for samples:
Some banks might have sufficient samples to develop a model, but the lack of sufficient variable data for the samples undermines the predictability of model. Thus banks must rely on external sources to obtain more

comprehensive variable data, such as credit data (e.g. credit records of customers with other banks, customer's credit score), data on corporate finance, macroeconomy, industry, and stock prices, which can improve the totality of explanatory variables if integrated with the bank's own variable data.

- (2) Inadequate samples (including normal samples and default samples): Banks often lack sufficient samples due to new business (no long-term default experience), nature of business (few samples for specialized lending cases), or risk segmentation (by for example area, industry, or firm size) and hence are unable to proceed with model construction and validation (including out of sample testing during model construction and backtesting after the model is in use).

3.2 Quantification of risk: Risk ranking and risk classification only provide some understanding of the relative risk associated with each customer or transaction. Banks must be able to estimate the risk components corresponding to each risk level or segment (probability

of default (PD), loss given default (LGD), the exposure at default (EAD)) based on long-term historical experience in order to apply the constructed risk model to use test - capital charge, loss provision, and risk pricing. In the process of quantifying risk components, the difficulties faced by banks may be summarized as follows:

- (1) Lack of sufficient samples in some asset default cases:
- Newly developed business or newly acquired assets: Take the example of cash card business that some banks put considerable efforts in in recent years, its accumulated loss data are relatively insufficient. In addition, in the case of a merger, the bank that sold its assets might not have had a comprehensive information system in place to preserve its loss data.

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- Interrupted business: For assets that were securitized or sold soon after the bank originated, there were typically less internal default experience because the asset was disposed before the peak of default was reached.
- (2) The duration of internal historical data for estimation of risk components was not sufficiently long: Even if the bank has accumulated sufficient default data, it still might not meet the minimum requirement for the length of historical data under IRB approach, so that the bank must treat those assets as non-material assets and calculate capital charge using standardized approach. As such, a bank must use two approaches to compute capital charge. In addition, Basel II sets a cap for non-material assets that are subject to rigorous supervisory review.
- (3) The risk component estimates lack comparison: Even if the bank meets the all the minimum requirements set for IRB approach, the risk component values estimated by the bank might lack external benchmarks for comparison purpose and for

analyzing the reasonableness of the discrepancy.

4. Functions of the Data Research Service Platform and available assistance

Under the premises of privacy preservation and information security, JCIC's Data Research Service Platform is designed to help banks improve their credit risk management by providing deidentified data for added value research and supplemented with necessary security control measures. Overall, the main functions of the Data Research Service Platform are to address two restrictions faced by the banks in their current use of JCIC database: **(1) banks are not allowed to access non-customer data;** **(2) banks are not allowed to access out-of-term (or undisclosed) data.** The assistance rendered to the banks through the Data Research Service Platform are summed up as follows:

4.1 Helping banks deal with data problem in the construction of IRB approach

In the aspect of rating system construction, banks can access datafiles

on the Data Research Service Platform for research purpose. In the aspect of quantifying risk levels, JCIC can produce long-term risk component values that are segmented in a manner similar to bank's portfolio and risk management for banks to carry out mapping and calibration of risk components.

4.2 Follow-up and feedback of performance of rejected customers and service-interrupted customers

Banks usually lack subsequent credit data of customers who once applied to the bank for credit but was rejected or customers for whom the bank discontinued service as determined by the bank's internal rating system. But the actual subsequent credit performance of those customers is of considerable value in terms of validation and modification of bank's internal rating system (i.e. backtesting). In other words, banks can track the credit status of customers who were once denied service or had service discontinued according to its credit rating system and credit policy to get a glimpse of the accuracy of its prior decisions, whether it was a wrong rejection (i.e. rejecting or discontinuing

service to a good customer incurs actual loss of business and profit) or a correct rejection (i.e. the bank actually averts losses). Such information provides essential feedback to a bank for it to modify its rating system or credit policy.

4.3 Risk assessment of new business

When a bank develops a new business, it lacks internal loss experience for the assessment of possible credit risk. The lack of such information might deter a bank from offering a new service, thereby losing the chance to enter a new market, or propel the bank to ride the wave blindly without estimating accurately the size of capital charge and loss provision which could put the operation of the new business in jeopardy before it is well established. Before starting a new business, a bank may, based on its credit strategy, obtain necessary information for market segmentation and risk evaluation through the Data Research Service Platform. This pre-launch assessment is particularly important in the time of a slow market and credit crunch. If a bank has access to objective and comprehensive information

for risk assessment so as to find the market niche with precise pricing, the bank might grow against market trend and help invigorate the whole credit market.

4.4 Analysis of other non-disclosed items

In light of the imminent implementation of Basel II, JCIC has revised the guidelines for reporting outstanding loan balance in 2004, asking member institutions to include some new information in their monthly reports, such as loan rate, (cumulative) amount due for the month, principal and interest payments received and expense for the month, appraised value of collateral, and borrowable amount. Because those data are commercially sensitive, they are not made available for inquiry by member institutions. But the statistical results and analysis of such data provides essential benchmark for credit risk research. Through compilation and deidentification, those data are totally desensitized in terms of commercial competition and can be offered to banks for research and analysis through the Data Research Service Platform.

4.5 Providing corporate scoring results that are not open to inquiry

JCIC has developed the corporate scoring model with the aim to share its model building technique and experience with banks. The results derived from the corporate scoring model can be used as external reference by banks for comparison purpose (benchmarking and calibration). Banks can also refer to this scoring model when they select explanatory variables for their internal rating model. However banks should not use the results from JCIC's corporate scoring model as the only basis for credit extension decision. Banks should set their own credit policy in consideration of the business status of customer, risk assessment method used, and the design of credit approval process and authority. The scoring results of JCIC's model should serve as one of the reference considerations. If a bank relies solely on JCIC's scoring model for its business decision-making, it might be too arbitrary and deprive the applicant's chance to obtain credit. Thus JCIC's corporate scoring model is not open for use by all

member institutions at the present time, but is provided through Data Research Service Platform to banks that have demonstrated that the JCIC scoring results will be used solely for the purpose of model construction. JCIC will consider opening the JCIC scoring results for inquiry by member institutions when the majority of banks understand the limitation of those data and have constructed their own credit policy model.

4.6 Spare database for member institutions

Banks that did not preserve historical data or have not had a data warehouse built can access their own historical data³ kept by JCIC through the Data Research Service Platform, and use JCIC's data warehousing equipment and data processing tools to carry out data extraction, sorting and analysis and save the data and analytical results in an assigned storage space for access at a later date.

5. Conclusion

The implementation of Basel II brings the attention of the domestic financial institutions to the importance of risk management and data collection. It also adds to the responsibility of JCIC database in terms of member institution assistance. The quality credit information built up by JCIC over a long period of time can be shared with member institutions only if the provision service complies with prevailing regulations and the privacy of the principal parties is safeguarded. The creation of Data Research Service Platform finds the proper balance between two originally conflicting practices—"data sharing" and "privacy preservation." It allows the data in JCIC database to be used by financial institutions in a reasonable and accurate manner according to well-defined policy and rules without deviating from the principle of data privacy protection.

Banks must rely on the availability of complete and accurate data to build their IRB system. JCIC, on its part to help banks address

³ Member institutions may buy back the credit data of their own customers through "customized inquiry" during the disclosure period. But for data beyond the disclosure period, banks can only access through the Data Research Service Platform for research and analysis given that the standard products have already taken offline.

the issue of internal data shortage, must complete two tasks: 1. build a data provision mechanism, i.e. the Data Research Service Platform; 2. provide risk-meaningful value addition know-how in congruence with bank's needs. JCIC is undertaking those two tasks with the help of scholars and research institutions at home and abroad and continues to make improvement. With respect to the data provision mechanism, JCIC continues to keep updated on the latest deidentification techniques (e.g. quantifying the deidentification level of cohort data⁴ and relative loss of information value) to seek a balance point between "privacy preservation" and "data sharing and application", and based on which, to adjust dynamically related information security control procedure and measures. In the aspect of enhancing the value addition know-how, JCIC will carry out necessary analysis and value

addition based on the new information provided under the revised guidelines for reporting outstanding loan balance (e.g. analysis of LGD data and model building; revision of asset portfolio model added with LGD results and conducting pressure testing and measurement of concentration risk).

The continuing promotion of those two tasks will aid the overall transparency of credit risk related information. For banks, it allows them to assess risk effectively and adjust their credit strategy; for the principals of data, it increases their chance to obtain credit and fairer and more reasonable interest rate; for the entire financial market, it helps improve the market discipline and performance.

⁴ Cohort data are research datafiles composed of statistical data of a group. Its function is similar to datafile composed of a single set of data. Only the principal of data is not an individual or a business, but a group of homogenous data. Thus cohort data are highly deidentified and retain fully their application value. Fannie Mae, a home mortgage lender in the US has made cohort data on real estate mortgage market available for research.