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Assessing Money Laundering Risk of Financial Institutions with AHP: Supervisory Perspective

Ke Jia[1,2], Xi Zhao[1], Ling Zhang[3]

[1]School of Management, Tianjin University, Tianjin, China
[2]Anti-Money Laundering Section, The People's Bank of China, Tianjin Branch, Tianjin, China
[3]Human Resources Department, Tianjin University, Tianjin, China
Email: lingzhang@tju.edu.cn

This paper proposed a risk assessment model with which supervisory authorities can calculate the money laundering risk (MLR) level of financial institutions and make comparisons among multiple institutions. The model is based on the Analytic Hierarchy Process (AHP) and decomposes MLR into two second-tier criteria, i.e. Inherent Risk & Control Risk. AHP pair wise comparisons made by the experts from various fields are processed through AHP software to get the weight of each factor. Using this model, MLR of each financial institution could be obtained and certain comparison among them could be carried out.

Keywords: Money Laundering Risk; Assessment; AHP

Introduction

Money laundering risk (MLR) is newly recognized as a serious risk endangering the financial sector as well as the whole society, and is drawing increasing attention in recent decades on both regulation and supervision. (Ferwerda, Kattenberg, Chang, Unger, Groot, & Bikker, 2013; Stokes, 2012; Kishor & Lescuyer, 2012) To appropriately apply the risk-based approach recommended in *International Standards on Combating Money Laundering and the Financing of Terrorism & Proliferation* by The Financial Action Task Force on Money Laundering (FATF) and efficiently allocate supervisory resources, national supervisory authorities need to accurately assess the MLR levels of financial institutions.

MLR of an institution could be affected by many factors, including institution size, internal rules, management attitude, and so on. In China, the assessment of MLR are mostly carried out by certain reviewers grouped with supervisors and specialists simply giving marks considering some factors (Cai & Liu, 2011). However, as risk factors are distinct from each other in their natures and weights (Wang & Yang, 2007), an overall accurate assessment could not be obtained using this method, consequently it is hard to make comparison within institutions.

Given that reviewers could not only raise the examining factors, but also point out the inherent relationship of these factors, which could then be analysed using Analytic Hierarchy Process (Saaty, 1990), the weight of each factors as well as reasonable marks could be obtained.

Locating MLR factors and building-up MLR structure have been challenging assessors and researchers in the worldwide in that the elements composing MLR are complicated (IIROC, 2010). This research created a MLR assessment model which enables reviewers to evaluate and compare the MLRs of financial institutions. The core task is to find the most significant risk factors and establish a logical MLR assessing model.

Method

AHP theory was proposed by Thomas. L. Saaty in 1970s, by

which complex issues can be structured and analyzed by hierarchical division, and subjective decision according to objective conclusions would be made. In this analysis, AHP software with version 0.5.2 was used to obtain the weights of index automatically.

Decomposing MLR into a Hierarchy of Factors

In reality, during the process of assessment, supervisory and management department always divide MLR (A) of a financial institution into two components, Inherent Risk and Control Risk, which could be deemed B_1 and B_2, respectively, as the second level of this AHP model.

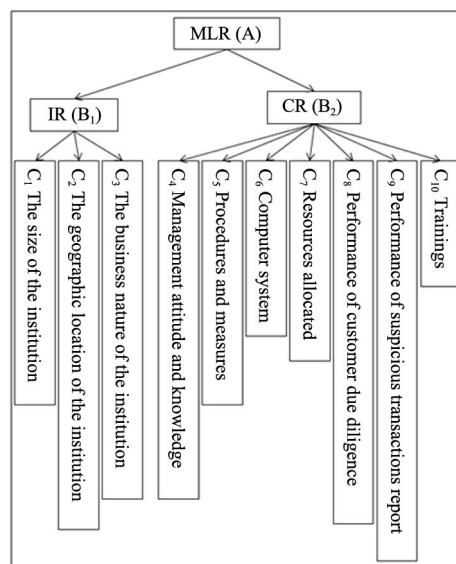The hierarchical structure of MLR is shown as **Figure 1**.

Figure 1.
MLR structure.

Inherent Risk (IR, B$_1$)

IR is the susceptibility of a financial institution to money laundering occurred given inherent and environmental characteristics, but without regard to the internal control structure. IR comprises a number of elements among which the following three are the most significant.

- *The size of the institution* (C$_1$). A multi-national bank has a higher possibility of being misused in laundering money than a local saving bank (Reserve Bank of New Zealand, 2011). Although the measurements of institution size are various (e.g. by asset, capital, revenue, profit, employee number or branch number, etc.), the number of customers is the most relevant indicator in analyzing the interaction between size and MLR of an institution because all money launderings are eventually committed by "customers", and thus could be used here to define the size of institution.

- *The geographic location of the institution* (C$_2$). This element actually concerns where the customers come from. Institutions operating in the regions with high crime rate would face more potential money-launderers and thus have higher MLR (Federal Financial Institutions Examination Council, 2010).

- *The business nature of the institution* (C$_3$). Institutions with high proportion of cash deposit or withdrawal, cross-border wire transfer and non-face-to-face businesses are normally more vulnerable to money laundering. (Council of Europe, 2010).

Control Risk (CR, B$_2$)

CR is the risk that money laundering may occur and not be prevented or detected on a timely basis by the internal control structure of the institution. CR is determined by the factors inside an institution and can be controlled by the institution. This paper identified the following seven fundamental factors which directly affect CR level and from which other inside factors are derived (Ma, 2009).

- *Management attitude and knowledge* (C$_4$). Reviewers can assess the senior executives' attitude and knowledge about AML by interviewing the executives as well as the employees or by checking the written responsibilities of the executives.

- *Procedures and measures* (C$_5$). Reviewers can assess the validity of the AML procedures and measures in an institution by off-site reviews.

- *Computer system* (C$_6$). The two core roles that the computer system is expected to play in the AML structure of an institution are storing customer identification information and transaction records and analyzing abnormal transactions. On-site test is needed to assess the efficiency of the AML computer system in an institution.

- *Resources allocated* (C$_7$). The resource allocated in AML can be measured by the total working hours of all AML staff in the institution or the amount of funds spent on AML.

- *Performance of customer due diligence* (C$_8$). On-site inspection is needed to assess whether the performance of customer due diligence regulatory requirements or internal procedures are fully implemented within an institution, including identifying and verifying the identity of the customer and the beneficial owner, recording the basic identity information of the customer, and so on.

- *Performance of suspicious transactions report* (C$_9$). On-site inspection is needed to assess whether STR regulatory requirements or internal procedures are fully implemented within an institution, including analyzing abnormal transactions, filing reports and making them to the financial intelligence unit.

- *Trainings* (C$_{10}$). To be assessed by interview or examination.

Making Pair-Wise Comparisons and Obtaining the Judgmental Matrix

After building AHP model, the priorities have been decided. Elements are compared pair-wise and judgments on comparative attractiveness of elements are captured using the traditional 9 rating scale, with 9 indicating "extreme importance", 7 indicating "very strong or demonstrated importance", 5 indicating "strong or essential importance", 3 indicating "fairly importance", 1 indicating "equal importance" when give the intensity of importance. Scores of 2, 4, 6, 8 demonstrate intermediate values and reciprocals show inverse comparison.

16 experts were invited to give the relative importance, and for the convenience of calculation, the average value is round number.

Results and Discussion

Pair wise comparisons are carried out with AHP software and the result is shown as **Table 1**.

As indicated by the table, with less one third contributed by IR (B$_1$, 30.2%) and most proportion determined by CR (B$_2$, 69.8%), the ML is basically "controllable" provided that the institution has a strong internal control system. Reviewers should thus focus more attentions on the CR control of a financial institution. Regarding the lowest hierarchy of factors, the primary task for a financial institution in mitigating MLR is to strictly conduct Performance of customer due diligence (C$_8$, 19.1%) and Performance of suspicious transactions report (C$_9$, 17.3%) measures, and supports from management (C$_4$, 9.4%) is also considerable important followed by valid internal rules (C$_5$, 9.1%). Although not controlled by the AML arrangement of the institution, the size of the institution also plays a significant role (C$_1$, 15.9%) in determining the MLR of the institution.

Table 1.
The weights of MLR factors.

1st hierarchy	2nd hierarchy	Weights to 1st	3rd hierarchy	Weights to 2nd	Weights to 1st
A	B$_1$	0.302	C$_1$	0.525	0.159
			C$_2$	0.200	0.060
			C$_3$	0.275	0.083
	B$_2$	0.698	C$_4$	0.134	0.094
			C$_5$	0.131	0.091
			C$_6$	0.072	0.050
			C$_7$	0.074	0.052
			C$_8$	0.273	0.191
			C$_9$	0.248	0.173
			C$_{10}$	0.068	0.047

Reviewers or assessors can mark a financial institution on each factor, multiply the marks by the weights of factors in **Table 1** and then add the products up to obtain the final weighted MRL mark of the institution. By comparing the weighted MLR mark of one institution with others, ranking of institutions could be obtained.

Conclusion

In this study, MLR was decomposed into a hierarchy of elements whose weights are computed by AHP. The MLR structure established and the weights of the elements obtained enable reviewers to calculate the MLR level of a financial institution and guide financial institutions to manage their MLR to some extent. The MLR in financial sector, however, constantly changes as a result of the development in society and economy, which requires a dynamic MLR assessment model. Adjustment on the MLR structure and the weights of risk elements should be on an ongoing basis.

Acknowledgements

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