INTERNAL AUDIT OF FOREIGN EXCHANGE OPERATIONS

By

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INTRODUCTION

Foreign exchange operations involve complex economic, political, technical and financial factors. Due to these complexities and the rapid deregulation of the New Zealand financial markets in recent years, there is a real danger that foreign exchange operations maybe mismanaged leading to major losses. A recent New Zealand survey by Deloitte Haskins and Sells on treasury operations, which include foreign exchange activities, as reported by the National Business Review stated:

> ... many organisations which had moved to manage financial risks by establishing treasury functions had done so without fully understanding the implications of mismanaging that function. This had led to spectacular and well publicised losses such as the 483 million marks Volkswagon lost through unauthorised dealing. (MacLennan, 1989, p.14)

This illustrates the magnitude of financial loss that can occur through mismanagement of treasury and, similarly, foreign exchange operations. A specific dollar amount for the total value of foreign exchange operations in New Zealand is not available[1], but it runs into many billions of dollars.

The research described in this paper addressed issues relating to the internal auditing of Foreign Exchange (FX) operations. As indicated above, foreign exchange operations carry high risk of loss due to the complexity of the factors involved. The primary objective of this research was to identify the seriousness of risks and appropriate management controls to deal with those risks. To achieve this two subobjectives were formulated. Firstly, all possible risks had to be identified, both from a normative and practical perspective. Secondly, the identification of all types of management controls theoretically appropriate and/or actually used to eliminate or reduce risk.

This research is likely to be particularly relevant in an Australasian context because of the high dependency of local economies on the export and import of goods and services involving millions of dollars of foreign exchange being handled each working day. Within New Zealand the deregulation of the financial markets, since 1984, has led to greater exposure to currency fluctuations, with the management controls to eliminate or reduce risk consequently becoming of greater importance.

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1. Discussions with the Department of Statistics, Massey University's Economics Department and Mr B.H. Doyle from the Rural Bank determined that no actual figure was available due to the difficulties in establishing a basis for measurement.

This aspect of financial management appears to have received little attention in the finance, management or audit literature and conference proceedings, yet it appears to be of real-world relevance. Thus there is a need for further knowledge in this area. The scope of this study has been limited to the financial management and control risks associated with foreign exchange trading or dealing. There has been no investigation of associated areas, although these have been mentioned briefly.

It was intended that this research would provide information for the construction of guidelines for the internal audit of foreign exchange operations. There seems to be limited expertise in this area in New Zealand and the results should be of interest to both academics and practitioners.

DEFINITIONS

This section defines some of the terminology used in this report.

Currency Position refers to an organisations actual monetary position of deals in various currencies at a given time. For example, whether the organisation is long or short (i.e. carrying a surplus or deficit) in $US and by what amount.

Foreign Exchange Operation is defined as any operation, both trading and financing, that involves a foreign currency.

Internal Audit is an independent appraisal function established within an organisation to examine and evaluate its (the organisation's) activities as a service to the organisation. The objective of internal auditing is to assist members of the organisation in the effective discharge of their responsibilities. To this end, internal audit furnishes them with analyses, appraisals, recommendations, counsel, and information concerning the activities reviewed. (Standards for Professional Practice of Internal Auditing, p.1)

Maturity Gaps refers to the gaps between settlement dates. An inappropriate settlement date can lead to liquidity problems. For example, an organisation should not borrow short and lend long.

Non-market prices refers to when an exchange rate which does not reflect current market realities is used in a foreign exchange transaction, either deliberately or accidentally.

Position Parking is when the organisation assumes a position in a currency, for hedging or speculative purposes.

Transaction Risk refers to the risk of foreign currency losses relating to a particular transaction. It is the risk individual to that transaction.

Translation is the process whereby financial data denominated in one currency are expressed in terms of another currency. It includes both the expression of individual transactions in terms of another currency (prior to settlement) and the expression of a complete set of financial statements prepared in one currency in terms of another currency. (SSAP-21, p.2)

Inherent Risk is the susceptibility of an account balance or class of transactions to misstatement that could be material, individually or when aggregated with misstatements in other balances or classes, assuming that there were no related internal controls. (AG-14).

Inherent risk can essentially be divided between:

Management Integrity

Business and Industry Risks

Control Risk is the risk that misstatement could occur in an account balance or class of transaction that could be material, individually or when aggregated with misstatements in other balances or classes, will not be prevented or detected on a timely basis by the system of internal control. (AG-14).

Control risk is essentially the risk of an error occurring because of either a lack of, or a breakdown of, internal control.

RESEARCH METHOD

The research was conducted in several stages.

Initially, there was the identification and refinement of the project. The extent of existing research in the chosen area had to be determined. Then a literature review was undertaken to determine the recognised risks that needed to be addressed when contemplating an Internal Audit of Foreign Exchange Operations. A list of appropriate Management Controls used to counter these risks was also established.

The data collection method was important. The choice of the type of method used would determine the depth and spread of the data obtained. Two methods were debated: firstly, structured interviews and, secondly, the use of a mail questionnaire. The questionnaire was subsequently chosen because of the extent of the coverage that could be obtained. This also required the identification and selection of the population to be surveyed and the determination of follow-up procedures to be undertaken. This coverage was deemed valuable in view of the lack of relevant literature.

The questionnaire was designed to enable respondents to evaluate the seriousness of the risks applying to their organisation. In addition, the respondents were asked to select the management controls that they felt were most appropriate to control each risk within their organisation.

A pilot survey of the risks and management controls was conducted to try to ensure that the questionnaire would be unambiguous to respondents.

The next step was to analyse the results obtained from the questionnaire to determine the significance of the responses. Also a matrix was developed showing Management Controls against risks for the various organisational sectors.

The final stage in this research was preparation of the report. The following sections expand upon this outline.

LITERATURE REVIEW

INTRODUCTION

A database search was initially undertaken on the Massey University on-line database with the key words being specified **Internal Audit** and **Foreign Exchange Operations**. No references were identified with both these phrases in the title. Two further database searches were conducted via the Massey University library, one with the key words being **Internal Audit** and the other being **Foreign Exchange Operations**. The databases searched were BRS and Dialog; these are both database consortiums with access to major North American libraries. Both of these, as expected, provided many references that were then examined for relevant contents.

A manual search of literature relating specifically to the subject of Internal Audit of Foreign Exchange was subsequently undertaken. The Internal Auditor Magazine (US) produces a Five-Yearly Index of its contents, these were reviewed for the years 1980 to present, and one specific article was identified. The Accountants' Index was reviewed from 1983-88, but no articles were identified. The Business Periodicals Index was also reviewed for the 1983-88 period with similar results.

The lack of directly relevant literature identified through the review was a concern at this stage, and an attempt was made to identify further literature by contacting practitioners in the area, and several Chapters of the worldwide Institute of Internal Auditors. A total of 25 letters were sent. A copy of the letter is shown as Appendix One. The response to this letter was encouraging and several other articles that contained valuable information were identified. Several of these responses are tabled in Appendix Two. One disappointing aspect was the lack of response from the overseas chapters of the Institute. Letters were sent to New Zealand, Australia, South Africa, United Kingdom and the United States. The only Institute reply received was from New Zealand.

LITERATURE REVIEW

Albergo (1981) discussed the need for the internal audit of foreign exchange operations. He stated:

> "The growth of world trade has created greater demand for an increasing number of nations' currencies. A few major currencies dominate all others. The need to facilitate currency transactions has stimulated the development of a broad international foreign exchange market between banks, money market dealers, and brokers ..."
>
> "The expanding foreign exchange trading operations and the volatility of foreign exchange markets create the need for effective audit and control". (p.23)

Appendix Three shows a hierarchy of general risk areas within Foreign Exchange Operations. The diagram is based on the risk areas identified by Albergo, which are discussed later in this section. To clarify these risks in an auditing framework two other scales have been added. These indicate the movement from General/Inherent risk to Specific/Control risk.

Albergo identified specific risk categories within the foreign exchange area. They are:

Business Risk - Economic, political, legal and regulatory considerations are risks beyond the entity's control which must be evaluated.

Management Risk - Significant risks relating to management involve effective separation of responsibilities, proper selection of personnel, adequacy of supervision, geographic dispersion of trading locations and pressure for profits.

Customer Risk - Risks associated with individual customers are principally credit related and pertain to customers' limits for foreign exchange trading and maximum daily delivery risk. Irregularities resulting from dealing with unauthorised or fictitious customers are also a potential risk.

Traders Risk - Much risk exposure centres around the trader. These risks can extend to excessive intraday or overnight currency positions, maturity gaps and position parking. Off-premises trading, unrecorded contracts, and trading for own account present unique risks. Non-market prices on contracts, incorrect details, or delayed completion of contracts present other risks as well as the potential for broker favouritism or collusion.

Transaction processing and accounting risk - In the transaction processing area, risks are associated with trading on inaccurate foreign exchange balances, unauthorised internal or customer's instructions, failure to receive or make payments, clerical errors, and the potential for making payments against insufficient or uncollected funds.

Foreign Exchange Position Valuations Risk - In reporting income on foreign exchange position valuations, risks are involved with incorrect foreign exchange rates, calculations, and the potential for shifting earnings between locations and income periods.

Yong (1986) defined the foreign exchange environment in the following manner.

> "An FX (Foreign Exchange) environment is a highly dynamic and volatile environment. Its operations are closely interlinked with the money market activities. The environment consists of financial institutions dealing daily in financial papers which are denominated in various currencies and which have a relatively short maturity period. Dealers buy and sell currencies at various rates to maximise their overall profits. The increasing risks and "materiality" of FX operations are creating a greater need for systems and audit controls. Any weakness in the system of internal controls can result in a substantial loss of revenue.' (p.1)

Yong (1986, p.9) stated that the FX transactions are exposed to certain risks that must be determined prior to considering the internal controls that are appropriate. These risks are

1. exchange rate risk
2. settlement risk
3. unauthorised dealing risk
4. forward exposure risk

5. administrative risk

6. liquidity risk

7. credit risk

Further he cited (p.10) a survey of professional external auditors, expressing five major concerns that should be addressed while conducting an audit of an FX operation.

* the accuracy of FX deals and of its recording and settlement system;
* the accuracy and timeliness of the FX reporting system (e.g. FX revaluation areas);
* the strict adherence to the financial institutions' policies and operating procedures;
* the compilation of FX financial statements ensuring they are in accordance with acceptable and standard accounting policy;
* that FX cash flows are authorised and meet management's requirements.

Yong gave no reference for the survey, and thus information relating to when, where and how many auditors participated is unknown.

Yong (1986) also included a list of risks about which he believed management should be fully aware (p.55). These are covered more generally in the risks previously noted.

Peat Marwick Mitchell & Co (1984) identified three major operational risks associated with foreign exchange (p.29). They are:

* Currency Risk - Exposure to unfavourable exchange rate movements on mismatched spot or forward positions in a currency.
* Credit Risk - Risk that a counterparty to a deal or loan will default.
* Liquidity Risk - Risk of insufficient liquid funds being available to cover commitments.

While this analysis of risks was relatively elementary in finance terms, this article identified the types of management controls that should be used to eliminate or reduce all types of risk. This article was the basis for many of the management controls used in the questionnaire, which is covered in a later section.

Eiteman & Stonehill (1982) considered economic and political risks, in addition to transaction and translation risk. Other specific risks were not mentioned.

THE QUESTIONNAIRE

The questionnaire was sent to organisations that were believed to be active in the FX field. The primary purposes of the questionnaire were:

* to validate the list of foreign exchange risks that had been identified
* to establish the operational significance of each risk
* to attempt to establish what management controls were considered appropriate to counter these risks.

There were several questions designed to obtain useful information to assist in the analysis. Their purpose will now be examined in greater detail. A complete questionnaire is attached as Exhibit Four.

QUESTION: What is your position within the company?

The respondents were asked to identify their position within the company. This was to identify if the seriousness of the perceived risk was dependent upon organisational position.

QUESTION: What is the approximate turnover of your company?

The approximate turnover of the company was required to identify whether there were threshold changes related to the seriousness of the perceived risk. These were to be given in NZ dollars to enable comparison.

QUESTION: What is the approximate value of your FX transactions?

The value of the total foreign exchange transactions was required, to determine if the foreign exchange transactions were material to the financial operations of each organisation.

STATEMENT: Indicate the approximate percentage of foreign exchange transactions which are for the purposes of trading operations or for financing purposes.

This question was intended to elicit information from which to determine the proportion of foreign exchange transactions that were for trading and financing purposes. The type of controls used might vary depending upon the nature of the transaction or the operational environment of the organisation.

STATEMENT: Rank the currencies by volume.

This question was designed to assist in determining the range of currencies in which the organisations' sampled were trading. In addition, it was to provide information which might indicate whether risk varied with different currencies.

The major section of the questionnaire was the table to be completed. This table required respondents to rank the seriousness of a comprehensive list of risks as they were perceived in relation to their particular organisation. The ranking to be used was the generally accepted audit scale of High/Medium/Low. Having completed this stage of the questionnaire the respondents were then asked to select, from a list of management controls, those that would be appropriate to reduce or eliminate the particular risk within their organisation. They were further requested to identify the most important control in relation to each risk.

In order to ensure that the design of the questionnaire was complete and, particularly, that the list of risks in the questionnaire was reasonably comprehensive, a small pilot survey was conducted. Four practitioners active in the Foreign Exchange area from three separate organisations were asked to evaluate the list of risks.

The pilot practitioners were:

Mr Doyle - Capital Market Section, Rural Bank.

Mrs Lynch - Internal Audit Manager, Auckland Savings Bank.

Mr Chik - Internal Audit Manager - New Zealand Wool Board.

Mr Smith - Senior Internal Auditor - New Zealand Wool Board.

The replies from these practitioners were encouraging. Only two minor modifications were needed to the list of risks before the questionnaire was finalised. The assistance of these practitioners was greatly appreciated.

THE COVERING LETTER

The covering letter was addressed to the Chief Executive of each organisation. The decision to direct the letter to the Chief Executive was made because of difficulty in determining just **who** to send the letter to. After consultation with Mr D.H.B. Esslemont, Marketing Department, Massey University, it was decided that the Chief Executive was in the best position to determine the most appropriate person in their organisation to complete the questionnaire. Further, any requests to a specific person to complete the questionnaire from a Chief Executive Officer may have received greater attention. However, there was a risk that a busy CEO may fail to give a survey a high priority, which may have reduced the response rate.

THE SAMPLE

The sample of organisations was selected from several different industry sectors.

These were as follows:

* Top 50 Publicly listed companies (determined by market capitalisation on October 6, 1989) based in New Zealand.
* Insurance Companies.
* Banking organisations.
* Producer Boards.
* State Owned Enterprises.
* Government Departments.

In some categories the Researcher's and Supervisors' judgement was used to determine which organisation's were to be surveyed.

A total of 98 questionnaires were mailed.

THE RESULTS

The initial mailing of the questionnaire produced 28 replies. A follow-up letter was mailed approximately two weeks after the initial request; this netted an additional 22 replies.

Of the 50 replies that were received, many were unusable due to only partial completion. 32 usable responses to the risk/control table were considered and analysed. Some of the other respondents had completed the first page of the questionnaire, which contained responses that were useful.

The low response rate may have reflected the research method used.

Of the nine (9) questionnaires sent to banking institutions only one (1) reply was received.

An analysis of the results to each major question will now follow.

QUESTION: What is your position within the company?

There was no apparent pattern to the responses from any industry sector, or overall. The position of the respondents was widely varied.

QUESTION: Does your company have an Internal Audit Department?

There were 38 usable responses to this question. Overall 17 (45%) of the respondents stated that their organisation had an Internal Audit Department. This was higher than anticipated based on previous research (Mathews, 1988). It was possible that firms without Internal Audit Departments declined to respond, biasing this response, but giving better data on the "remainder".

The breakdown of the results into industry sectors revealed substantial differences between the sectors, suggesting that the overall 45% response rate may be misleading.

	No. of Replies	I.A. Depts	%
Top 50 Companies	16	4	25
Insurance Companies	5	3	60
Banks	1	1	100
Producer Boards	3	0	0
SOE's	6	4	67
Government Departments	7	5	71

These results show a wide variation in the number of responses and the presence of an Internal Audit (I.A.) Department. Appendix Five contains a table of responses relevant to questions 2-5.

QUESTION: What is your company turnover?, and what is the approximate value of your FX transactions?

The information yielded under these questions was not able to be used because of the low response rates. Insufficient replies were received to conduct meaningful statistical analysis. Overall, the turnover of the organisations varied from $12 million to $3 billion, with one organisation reporting $2 billion annual Foreign Exchange transactions. The total annual turnover of the respondent organisations was $16.547 billion, with annual foreign exchange transactions of $7.4 billion. Despite a low response rate, the size of the potential exposure does indicate the importance of good information on the validity of risk analysis and control procedures in this area.

STATEMENT: Indicate the approximate percentage of foreign exchange transactions which are for the purposes of trading operations or for financing purposes?

The low response rate did not allow analysis to determine whether any particular industry sector uses Foreign Exchange to a greater extent for trading or for financing operations. Organisations varied from 100% of foreign exchange transactions for financing purposes to 100% for trading operations.

STATEMENT: Rank the currencies by volume.

The top three currencies were recorded for each of the valid responses. These are tabulated in Appendix Six.

The $US was the most heavily traded currency, followed by the $A. Pounds Sterling was in third position. It had been expected by the researcher that the Japanese Yen would have had a higher profile.

These results have subsequently led to the untested hypotheses that many Japanese deals may be denominated in $US, or that the sample or respondents did not include the major players in the Yen market.

THE RISK/MANAGEMENT CONTROL TABLE

The low volume of usable responses meant that rigorous analysis of the results would not be appropriate. Discussions with Dr R.H. Morton of the Mathematics and Statistics Department, Massey University, suggested that the most appropriate test that could be undertaken was a Chi Squared analysis.

Individual sector responses could not be analysed for significance because of insufficient cell numbers. To facilitate analysis, the responses were grouped into two initial categories - public and private sector.

These two groups were then compared for any significant differences in their risk assessment. Initially the risks were compared in their three categories - High, Medium and Low. A second Chi Squared analysis was performed with the High and Medium risk responses combined to determine whether their combined frequencies would identify any significant factors. No differences of statistical significance were found. Appendix Seven contains the results of the Chi Squared computations.

An interesting finding, which contradicted expectations based on the literature review is that, overall the respondents appear to have considered virtually every risk to be of low impact to their organisation. Given the inherent nature of foreign exchange operations, it would be anticipated that, prior to application of controls, several of the risks would have been categorised as creating a high level of risk exposure. The frequencies of the respondents to each risk category are shown in Appendix Eight. As can be seen from the table there is an overall tendency for the risks to be evaluated as low. There are a few risks that receive several ratings, but the trend is still towards the low category. Very few respondents felt that any particular risk was of high impact to their organisation.

This response may have been created by the respondents considering the seriousness of the risk after having considered the management controls or their being unwilling to disclose certain risks as being high. This is identified as an area for further research.

The Management Control variable provided the most interesting results of the research. It had been anticipated that there would be some predictability in the types of management controls used to reduce or eliminate the risks. This was not found to be the case. Several risks had up to eleven (11) different controls being used by different respondents. A table of the Management Controls used for each risk is shown in Appendix Nine. It should be noted that the Appendix shows only those controls which were stated by the respondents to be the most important control used.

An example of the diversity of the controls being used is as follows:

for the risk, **Using the wrong FX rate on settlement** (Risk 17), the controls suggested by respondents as being the most important were:

	No. of Respondents
Supervised duties of staff	3
Regular checks made on adherence to limits	1
Regular checks made on the accuracy and completeness of database information	1
Regular review of settlement procedures	6
Regular audit of the dealing operation as a whole	2
Regular recording of unrealised gains or losses	3
The preparation of management reports to assist in the monitoring and supervision of foreign exchange operations	1
Stop-loss limits	1
Separation of duties of staff	2

This example contains nine (9) different management controls for one risk. Several of these controls would appear to be inappropriate for controlling the given risk.

ANALYSIS OF RISK/CONTROL RESPONSES

Risk 1 - **Economic or Political change within a trading country.**

The preferred response was control 1, which was chosen by all respondents.

Control 1 was regular re-evaluation of business, political and economic conditions within trading countries.

Risk 2 - **Legal or Regulatory change to a trading country's economy**

The preferred response was control 1, which was selected by all but one respondent. That respondent chose control 16, regular recording of unrealised gains or losses. This (control 16) does not reduce or eliminate the risk it merely records the damage caused.

Risk 3 - **Lack of separation of duties**

The preferred response was control 2, supervised duties of staff. There was a cluster of responses for control 2, and also control 24 which was separation of duties of staff. This question assumed that staff could not be separated, hence control 2 was more appropriate. This may have been unclear. There were other responses chosen. These were:

Control 3 - regular personnel evaluation
14 - regular review of settlement procedures
15 - regular audit of dealing operation as a whole
18 - the preparation of management reports

Control 15 is a spasmodic control. The other controls do not address the day to day risk of unseparated duties of the operation as a whole. It may be that they trust their staff and therefore only use medium term review procedures and management controls.

Risk 4 - **Unsatisfactory performance due to improper selection of personnel**

The preferred response was control 3, which was regular personnel evaluation. The majority of respondents chose this option. There was a small cluster who chose control 2, supervised duties of staff, which is tangentially applicable. Other controls chosen were:

Control 1 - re-evaluation of business, political and economic conditions

18 - the preparation of management reports.

Control 18 may be applicable if the management reports monitor individual staff, and are actually used by management for this purpose. Control 1 is not appropriate. The re-evaluation of trading conditions has nothing to do with personnel selection.

Risk 5 - **A pressure for profits causing undue exposure**

The preferred response was control 18, the preparation of management reports, as they allow the entire operation to be monitored for exposure, and management can adjust accordingly.

There were several other controls that may have attained a similar objective.

Other inappropriate controls chosen were:

Control 1 - re-evaluation of trading conditions

16 - regular recording of unrealised gains or losses

21 - stop-loss limits

24 - separation of duties of staff

these controls do not identify undue exposure. The need for Controls 16 and 21 may result because of undue exposure.

Risk 6 - **The default of a counterparty to a loan or deal**

The preferred response was Control 22, regular scrutiny of trading partner's financial positions. The majority of respondents chose this control. There was another small cluster for control 7, the regular review of appropriateness of all limits, which was also applicable. Several other controls relating to limits were also chosen.

Control 17 - regular review of authorisations and Control 18 - the preparation of management reports were also chosen, these do not reduce or eliminate the risk, and are therefore inappropriate.

Risk 7 - **The uncontrolled/inappropriate introduction of new dealers to the forex markets**

The preferred response to this risk was Control 22, regular scrutiny of trading partner's financial position. None of the respondents chose this. The introduction of new dealers appears to have interpreted as new dealers within the respondent organisations, it was actually meant to have been interpreted as new dealers introduced by a trading partner. The respondent organisations have listed controls they would take to monitor their own staff. This shows the importance of careful wording and how pilot testing with only experts can fail to identify "loopholes".

Risk 8 - **Third World Debt**

The preferred response was Control 1, regular re-evaluation of conditions. The majority of respondents chose this control. Other controls chosen were:

Control 7 - regular review of appropriateness of all limits
11 - backup procedures for data
22 - regular scrutiny of trading partners' financial positions

Controls 7 and 22 are applicable. Control 11 relates to computer operations and is totally inappropriate.

Risk 9 - **The effect of International Time Zones**

There was no preferred control to this risk. The most appropriate would be control 4, daily settlement limits. Only one respondent chose that option. Other controls chosen were:

Control 1 - regular re-evaluation

11 - backup procedures for data

14 - regular review of settlement procedures

18 - the preparation of management reports

19 - fixed dealing hours

20 - dealing restricted to organisations' premises

Control 11 is inappropriate as it relates to computer operations. The other controls mentioned are somewhat tangential, but may still be useful.

Risk 10 - **Dealers trading on their own account**

The preferred response was Control 15, regular audit of the dealing operation as a whole. Several respondents chose this control. Other controls chosen were:

Control 1 - regular re-evaluation

2 - supervised duties of staff

3 - regular personnel evaluation

6 - total limits per client

8 - regular checks made on adherence to limits

16 - regular recording of unrealised gains or losses

17 - regular reviews of authorisations

20 - dealing restricted to organisation's premises

24 - separation of duties of staff

Several of these controls are applicable in this area, but not individually effective. They are controls 2, 3, 17, 20 and 24. The remaining controls are not appropriate to reduce this risk.

Risk 11 - **The effect of unrecorded contracts**

The preferred response was Control 15, regular audit of the dealing operation as a whole. Other options chosen were:

Control 2 - supervised duties of staff
8 - regular checks made on adherence to limits
14 - regular review of settlement procedures
16 - regular recording of unrealised gains or losses
18 - the preparation of management reports
22 - regular scrutiny of trading partners' financial position
23 - restricted access to computer operations
24 - separation of duties of staff

Controls 2, 14, 18 and 24 may be of some value as controls. The other responses appear inappropriate.

Risk 12 - **Non-market prices on contracts**

There was no preferred response in the table to this risk. An appropriate "write-in" control would have been supervisory review of all contract prices. The most generally applicable control was number 15, a regular audit of the dealing operation. Other controls chosen were:

Control 2 - supervised duties of staff
8 - regular checks made on adherence to limits
13 - regular checks on the database information
14 - regular review of settlement procedures
16 - regular recording of unrealised gains or losses
17 - regular reviews of authorisations
18 - the preparation of management reports
24 - separation of duties of staff

Controls 2, 14, 17, 18 and 24 may be applicable to reduce this risk. Control 13 would be applicable if the non-market price was an error. Controls 8 and 16 are not appropriate.

Risk 13 - **Over-reliance on too few dealers**

The preferred response was Control 3, regular personnel evaluation. Several respondents chose this control. Other options chosen were:

Control 2 - supervised duties of staff
6 - total limits per client
7 - regular review of appropriateness of all limits
14 - regular review of settlement procedures
16 - regular recording of unrealised gains or losses
18 - the preparation of management reports
21 - stop-loss limits
24 - separation of duties of staff

Controls 2, 14, 18 and 24 may be useful to reduce this risk. The other controls do not seem appropriate to this risk.

Risk 14 - **An incidence of computer failure**

The preferred response was Control 9, a recovery plan for computer failure. Several respondents chose this option. Several others chose control 10, offsite backup computer facilities, or control 11, backup procedures for data. Both these controls should be included in a good recovery plan. The two other options chosen were:

Control 12 - regular review of computer backup log
23 - restricted access to computer operations

Neither of these would be helpful in an incidence of computer failure.

Risk 15 - **Ineffective settlement functions**

The preferred response was Control 14, regular review of the settlement procedures. The majority of respondents chose this option. Other controls chosen were:

Control 2 - supervised duties of staff
4 - daily settlement limits
12 - regular review of computer backup log
15 - regular audit of dealing operation
17 - regular reviews of authorisations
24 - separation of duties of staff

Controls 2 and 15 are applicable. The other controls chosen would not monitor or impact on the effectiveness of the settlement function and are therefore inappropriate.

Risk 16 - **Corrupt data on the FX masterfile**

The preferred response was Control 13, regular checks made on the accuracy and completeness of database information. The majority of respondents chose this option. Other alternatives chosen were:

Control 8 - regular checks made on adherence to limits
9 - a recovery plan for computer failure
10 - offsite backup computer facilities
11 - backup procedures for data
15 - regular audit of the dealing operation
23 - restricted access to computer operations

All except control 8 may be applicable depending upon the nature of the corrupt data. Control 8 has no bearing whatsoever on the FX masterfile.

Risk 17 - **Using the wrong FX rate on settlement**

Control 2, supervised duties of staff, and control 13, regular checks on database information, were appropriate dependent upon the reason for the wrong FX rate being used. Other controls chosen were:

Control 8 - regular checks made on adherence to limits
14 - regular review of settlement procedures
15 - regular audit of dealing operation
16 - regular recording of unrealised gains or losses
18 - the preparation of management reports
21 - stop-loss limits
24 - separation of duties of staff

Controls 14 and 15 may be applicable under certain circumstances, but are not constant controls. The other controls chosen would have no effect the FX rate being used, and are not appropriate.

Risk 18 - **Insufficient funds to cover commitments**

The preferred response was Control 18, the preparation of management reports to assist in the monitoring and supervision of foreign exchange operations. Several respondents chose this option. Others chosen were:

Control 2 - supervised duties of staff
4 - daily settlement limits
6 - total limits per client
8 - regular checks made to adherence to limits
13 - regular checks made on database information
14 - regular review of settlement procedures
15 - regular audit of dealing operation
17 - regular review of authorisations
21 - stop-loss limits

All these controls could be tangentially applicable dependent upon the circumstances.

Risk 19 - **Using erroneous currency positions**

The preferred response was Control 18, the preparation of management reports. Control 13, regular checks on database information, is also important. Several respondents chose other controls. These were:

Control 2 - supervised duties of staff

3 - regular personnel evaluation

15 - regular audit of dealing operation

16 - regular recording of unrealised gains or losses

21 - stop-loss limits

24 - separation of duties of staff

Controls 3, 21 and 24 are not very appropriate because they have no direct effect on the currency position used, or calculated. The other controls may be applicable.

Risk 20 - **Interest rate exposure**

The controls preferred were Control 1, regular re-evaluation of business conditions, and Control 18, the preparation of management reports. Other options chosen were:

Control 2 - supervised duties of staff

4 - daily settlement limits

7 - regular review of appropriateness of all limits

15 - regular audit of dealing operations

16 - regular recording of unrealised gains or losses

24 - separation of duties of staff

Controls 16 and 24 are not applicable as they will not effect the amount of exposure to an interest rate fluctuation.

Risk 21 - **Fraudulent settlements**

The preferred response depended on <u>who</u> was fraudulent during settlement, one of the respondents staff or the client. If the fraud was instigated by the respondent's staff member control 2, supervised duties, and control 24, separation of duties, are appropriate. If the fraud was instigated by a client control 22, regular scrutiny of a trading partners' financial position was appropriate. Other options chosen were:

Control 14 - regular review of settlement procedures

15 - regular audit of the dealing operation

18 - the preparation of management reports

All of these controls are applicable depending upon the situation.

The research undertaken for this project does not allow conclusions to be drawn on the reasons for such variability, however, the diversity of the controls being used poses several interesting questions that should be addressed in further research.

CONCLUSIONS

This research has identified the major theoretical risks and management controls relating to FX operations, and has obtained feedback from practitioners via a questionnaire. The low response rate to the questionnaire, especially in some key sectors, means that few or no general conclusions about sectors should be drawn.

The respondent organisations had annual turnover in excess of $16 billion, with foreign exchange transactions in excess of $7 billion.

There were three particularly interesting findings from this research. Firstly, almost all of the respondents regarded the risks to be low (of little significance/impact) to their organisation. Secondly, and probably the most important finding, is the variability in the type of management controls being used to counter risk. There was little apparent uniformity of management controls, with up to eleven (11) different controls being suggested to control a particular risk, with some being obviously inappropriate. Further research could usefully explore why this variability exists. Thirdly, this research identified that significantly little research has been carried out in this high risk area . The lack of relevant literature also highlighted an apparently serious deficiency in knowledge in this area.

The low usable response rate has also had an impact on the results. Generalisations reflecting the population as a whole are unable to be drawn from this survey.

This research has explored areas that do not appear to have been previously investigated from the current perspective, and has established a base from which further research can proceed into this area.

FURTHER RESEARCH

An important result has been the identification of areas that require further research. Each of these potential areas will be discussed.

Risk Evaluation - Most of the respondents stated that the majority of the risks considered were of low risk to the organisation. Further research is needed to determine why these risks are deemed to be of relatively little significance to practitioners given their potential inherent risk, the frequent, apparent inappropriateness of control procedures and the scale of financial exposure.

Management Controls

The wide variety of management controls being used to control risk poses several interesting questions. Firstly, are the literature based theoretical controls inappropriate to practical foreign exchange requirements? Secondly, does the lack of uniformity among controls used reflect differing organisational structures? Or thirdly, does the lack of uniformity represent a lack of understanding of the risks that are trying to be controlled.

Currencies Traded - The current results led the researcher to believe that many organisations are transacting with $US denominated contracts. This may account for why currencies such as the Japanese Yen are more thinly traded than expected. This trading in $US contracts could allow trading to take place with organisations or countries that are of higher risk without being identified. The use of the $US denominated contract could be researched and the focus of controls being utilised+.

Many of the areas requiring further research touch on highly sensitive areas of financial management. To obtain meaningful data it is probable that structured interview techniques will be more appropriate than the questionnaire approach used for this initial study.

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TABLE OF APPENDICES

APPENDIX 1

Facsimile

MASSEY
UNIVERSITY

Palmerston North
New Zealand
Telephone (063) 69-099

FACULTY OF
BUSINESS STUDIES

DEPARTMENT OF
ACCOUNTANCY

Dear Sir/Madam

INTERNAL AUDIT OF FOREIGN EXCHANGE OPERATIONS

I am currently conducting post-graduate research in the area of Internal Audit of Foreign Exchange Operations. In accord with normal academic practice my research began with a literature search. However, traditional sources reveal very little information in this subject and I am seeking assistance from other sources.

Can you assist me?

Any material, or references to any material, dealing with the above topic would be gratefully received.

Thank you for your time and consideration.

Yours sincerely

C M H Mathews
Assistant Lecturer in Accountancy

APPENDIX 2

R&I

The Rural and Industries Bank of Western Australia

[redacted]

Codes:
Bentley's Second
Peterson's International
Fourth Edition

Enquiries: Internal Audit
Telephone: [redacted]

Your Ref:
Our Ref: CMH:JHM:AUC08CH4

10 August 1989

Mr C M H Mathews
Assistant Lecturer in Accountancy
Department of Accountancy
Massey University
PALMERSTON NORTH
NEW ZEALAND

Dear Mr Mathews

FOREIGN EXCHANGE OPERATIONS

Thank you for your letter.

The audit of foreign exchange operations is a relatively new area with procedures only being developed and refined over the past five years or so in Australia.

Unfortunately we cannot provide you with our own audit programme which was developed with the assistance of outside consultants, Price Waterhouse & Co. However, two very good publications on the subject are as follows:

1. "Foreign Exchange: Systems and Audit Controls"
   by L P Young published by CCH International, January 1989
   (New Zealand address: [redacted]

2. "Foreign Exchange Trading in Australia"
   by Peat, Marwick, Mitchell & Co, 1984

I trust that you will find these sources satisfactory. Peat, Marwick in particular have specialist expertise in the field.

Yours sincerely

C M Holyday
ASSISTANT MANAGER
INTERNAL AUDIT DEPARTMENT

APPENDIX 2 (Continued)

KPMG Peat Marwick

Chartered Accountants

[redacted]

Mail address

[redacted]

[redacted]

Our Reference:

31 August 1989

GSS/PJP

Mr C.M.H. Mathews
Assistant Lecturer in Accountancy
Massey University
PALMERSTON NORTH

Dear Mr Mathews

INTERNAL AUDIT OF FOREIGN EXCHANGE OPERATIONS

Thank you for your letter which we received on 4 August 1989.

We have been unsuccessful in finding any publications which would assist you in your research but we will contact Mr Peter Marriott of our Melbourne office who may be able to help you.

We will contact you as soon as we have any information.

Yours faithfully
PEAT MARWICK

G.S. SINCLAIR

APPENDIX 2 (Continued)

Westpac Banking Corporation

[redacted]

6 September 1989

C M H Mathews
Assistant Lecturer in Accountancy
Massey University
PALMERSTON NORTH

Dear Sir/Madam

I acknowledge receipt of recent letter regarding Internal Auditing of Foreign Exchange operations. I can appreciate the difficulties you are experiencing researching the topic.

Attached is a list of possible reference materials which may be of assistance.

If you are ever in Wellington I would be happy to discuss our audit approach, however, it is not audit policy to discuss or provide specific materials pertaining to the audit of Westpac's Treasury operations.

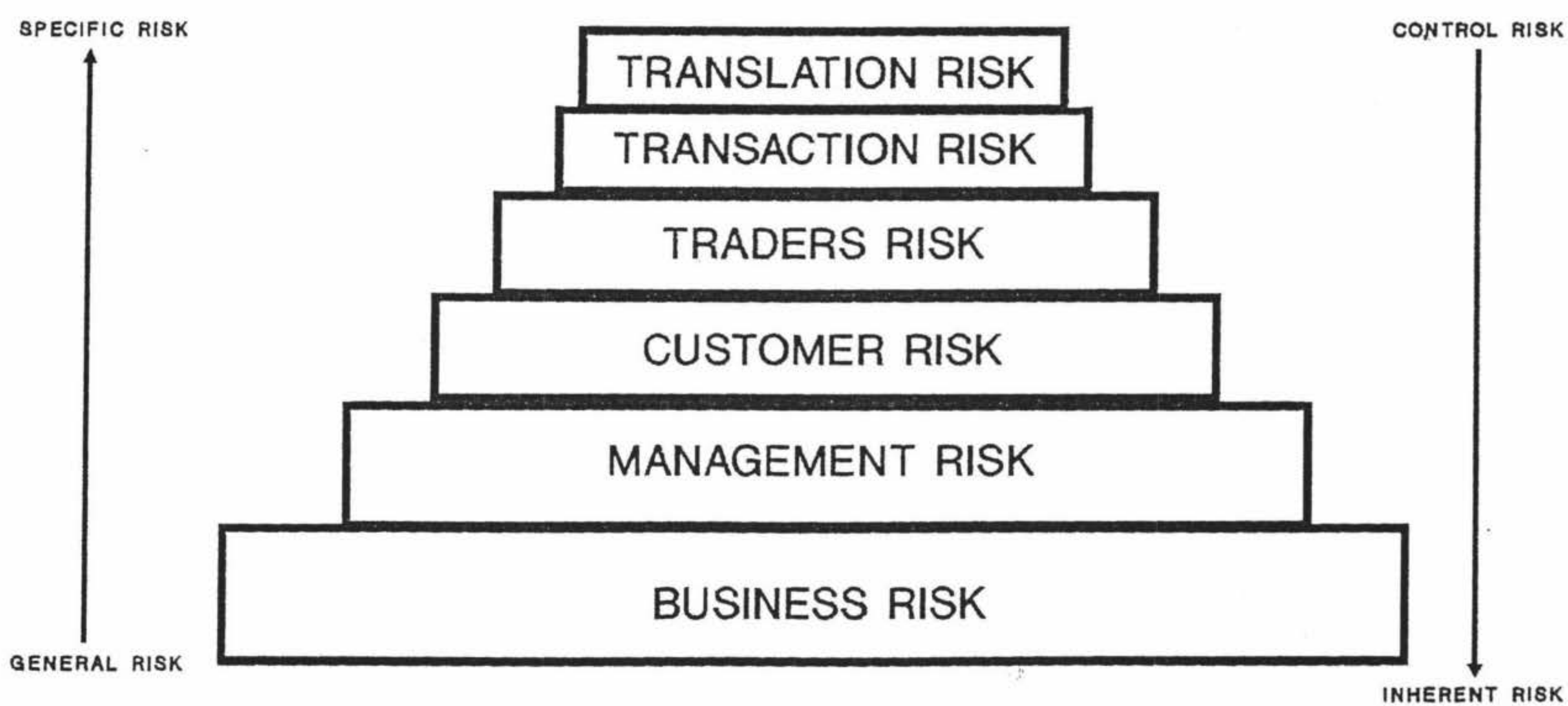
Please keep me informed of your research results and any reference materials you think could be of interest to me.

Yours faithfully

Ken Lister
MANAGER, WHOLESALE BANK AUDIT

Enc

APPENDIX 3


SPECIFIC RISK
CONTROL RISK
TRANSLATION RISK
TRANSACTION RISK
TRADERS RISK
CUSTOMER RISK
MANAGEMENT RISK
BUSINESS RISK
GENERAL RISK
INHERENT RISK

APPENDIX 4

Facsimile [redacted]

MASSEY UNIVERSITY
Palmerston North
New Zealand
Telephone (063) 69-099

FACULTY OF BUSINESS STUDIES

DEPARTMENT OF ACCOUNTANCY

14 November 1989

To the Chief Executive

This is a follow up letter concerning the survey into Internal Audit of Foreign Exchange Operations. If you have already responded please disregard this letter. If you have not responded a replacement questionnaire is attached for your convenience. Your response is valuable to us.

The questionnaire has been designed to take about 15 minutes to complete. For your convenience, a self addressed envelope has been included to return your completed questionnaire. If your company has an Internal Auditor please forward the questionnaire to them for completion. If not, please forward the questionnaire to the person most qualified to complete it. I would appreciate receiving your response by November 27, 1989.

Any information supplied will be treated in confidence. Individual respondents will not be indentifiable in any reported results. The coding number on the bottom of the questionnaire is for follow up purposes, which will not be necessary if we receive your response promptly.

Thank you for your time and consideration. We look forward to your reply.

Yours sincerely

Clive Mathews
Accountancy Department

APPENDIX 4 (Continued)

What is your position within the company? ____________________

Does your company have an Internal Audit Department? Yes / No

What is the approximate turnover of your company? NZ$______________

What is the approximate value of your organisation's foreign exchange transactions? NZ$__________

Please indicate the approximate percentage of foreign exchange transactions which are for the purposes of:

1. Trading Operations | |
2. Financing |___|

Please rank the following currencies by volume in regard to your organisation. (1 = greatest volume, 2 = next greatest, etc.)

U S Dollars	|____|	GB Sterling	|____|
Hong Kong Dollars	|____|	Australian Dollars	|____|
Deutsche Marks	|____|	Japanese Yen	|____|
French Francs	|____|	Italian Lira	|____|
Swiss Francs	|____|	Roubles	|____|
Canadian Dollars	|____|		

Others, please list: ______________________

____

____

____

The attached table lists the <u>major</u> risks involved with foreign exchange activities.

<u>Instructions</u>:
1. Evaluate the risk of each item to your organisation and state whether you consider it to be a high, medium or low risk.
2. A list of Management Controls is provided below the table. Please identify, in the Management Control column of the table, those controls that you believe could be used to eliminate or reduce each individual risk. Controls may be used several times.

APPENDIX 4 (Continued)

RISKS	#	SERIOUSNESS OF RISK High	Medium	Low	MANAGEMENT CONTROLS Please list below			
Economic or political change within a trading country.	1							
Legal or regulatory changes to a trading countries economy.	2							
Lack of separation of duties.	3							
Unsatisfactory performance due to improper selection of personnel.	4							
A pressure for profits causing undue exposure.	5							
The default of a counterparty to a loan or deal.	6							
The uncontrolled/inappropriate introduction of new dealers to the Forex markets.	7							
Third World debt.	8							
The effect of International Time Zones.	9							
Dealers trading on their own accounts.	10							
The effect of unrecorded contracts.	11							
Non-market prices on contracts.	12							
Over-reliance on too few dealers.	13							
An incidence of computer failure.	14							
Ineffective settlement functions.	15							
Corrupt data on the FX masterfile.	16							
Using the wrong FX rate on settlement.	17							
Insufficient funds to cover commitments.	18							
Using erroneous currency positions.	19							
Interest Rate exposure.	20							
Fraudulent settlements.	21							
Others, please list below:								

These numbers have been entered for reporting purposes.

APPENDIX 4 (Continued)

MANAGEMENT CONTROLS

Below is a list of possible management controls. Please list the control numbers in the Management Control column of the table. Where more than one control is indicated, please circle the control which you consider to be the most important.

1.	Regular re-evaluation of business, political and economic conditions within trading countries.	(re-evaluate conditions)
2.	Supervised duties of staff.	(supervision)
3.	Regular personnel evaluation.	(personnel)
4.	Daily settlement limits.	(daily limits)
5.	Maximum daily client limits.	(daily client limits)
6.	Total limits per client.	(total client limits)
7.	Regular review of appropriateness of all limits.	(review of limits)
8.	Regular checks made on adherence to limits.	(adherence to limits)
9.	A recovery plan for computer failure.	(recovery plan)
10.	Offsite backup computer facilities.	(offsite backup)
11.	Backup procedures for data.	(backup procedures)
12.	Regular review of computer backup log.	(computer log)
13.	Regular checks made on the accuracy and completeness of database information.	(database quality)
14.	Regular review of settlement procedures.	(settlement procedures)
15.	Regular audit of the dealing operation as a whole.	(regular audit)
16.	Regular recording of unrealised gains or losses.	(recording gains/losses)
17.	Regular reviews of authorisations.	(authorisations)
18.	The preparation of management reports to assist in the monitoring and supervision of foreign exchange operations.	(management reports)
19.	Fixed dealing hours.	(dealing hours)
20.	Dealing restricted to the organisation's premises.	(dealing restrictions)
21.	Stop-loss limits.	(stop-loss limits)
22.	Regular scrutiny of trading partners' financial positions.	(financial review)
23.	Restricted access to computer operations.	(computer access)
24.	Separation of duties of staff.	(separation)

Others, Please list:

25.
26.
27.
28.
29.
30.

APPENDIX FIVE

REPLIES TO QUESTIONS 2 - 5

Internal Audit Department (1=Yes, 0=No)	0	0	1	0	0	1	0	0	1	0	0	1	0	0	0	0	1	0	0	1
Annual Turnover (millions)	90	215	1500	240	130	3000	300	30	1200	700	30	76.4	19.6	200	12	413	2910	30	355	50
Annual FX transactions	20	110	1000	200	50	1500	30	5	250	2000	2	2	1	40	14	100	0	0.1	188	2
% Trading	50	0	10	100	80	40	0	100	90	50	50	60	40	100	100	70	0	100	100	100
% Financing	50	100	90	0	20	60	100	0	10	50	50	40	60	0	0	30	0	0	0	0

																		TOTAL
1	1	1	1	1	1	0	0	1	0	0	0	1	0	1	1	0	1	17
0	0	250	42	152	80	23	60	0	200	500	15	1800	500	580	300	144	400	16547
0	0	0	2.5	10	10	0	10	0	100	900	9	600	100	15	35	0	100	7405.6
0	0	0	100	70	90	0	100	0	40	66	0	65	5	95	100	0	100	
0	0	0	0	30	10	0	0	0	60	34	100	35	95	5	0	0	0	

APPENDIX SIX

TABLE SHOWING TOP THREE CURRENCIES (BY VOLIME) USED BY RESPONDENTS

US DOLLAR	1	1	1	1	2	1	1	1	2	1	3	1	3	2	1	1	1	1	1	2				1	1	2	2	1		1	1	1
DEUTSCHE MARK							3														1			3	2	1						
FRENCH FRANC																					2											
SWISS FRANC		2	2									2									3											
CANADIAN DOLLAR	3																															
POUNDS STERLING							2	2	3		2	3	2	1				2		3		1	1			3	1		3	3		
AUST. DOLLARS	2		3	2	1	2		3	1	2	1		1		2	3				1		2	2					2		2	2	2
YEN					3	3				3						2		3						2	3		3	3				
NETHERL GULIDER														3																		
SWED. KRONER																													1			
NORWEG. KRONER																													2			

APPENDIX 7

RESULTS OF CHI SQUARED COMPUTATIONS

		USING HIGH, MEDIUM AND LOW AS SEPARATE VARIABLES	USING HIGH AND MEDIUM COMBINED VERSUS LOW AS VARIABLES
RISK	1	.826	.814
	2	.35	.35
	3	3.106	2.341
	4	1.695	1.1
	5	.32	.25
	6	4.257	.581
	7	1.344	.774
	8	3.475	.303
	9	1.636	1.616
	10	1.494	.247
	11	2.437	2.168
	12	2.175	.804
	13	.797	.794
	14	2.134	1.28
	15	1.491	1.044
	16	5.252	2.46
	17	4.593	.493
	18	.217	.158
	19	.355	.304
	20	1.275	.057
	21	3.772	1.741
		ANY SIGNIFICANCE REQUIRED RESULT TO BE $>$5.77 FOR 2 DEGREES OF FREEDOM AT 95% CONFIDENCE LEVEL	ANY SIGNIFICANCE REQUIRED RESULT TO BE $>$3.99 FOR 1 DEGREE OF FREEDOM AT 95% CONFIDENCE LEVEL

BASED ON THESE RESULTS THERE IS NO SIGNIFICANCE TO THE DISTRIBUTION OF THE RISK FREQUENCIES.

APPENDIX 8

TABLE SHOWING FREQUENCY OF RESPONDENTS TO EACH RISK CATEGORY

		HIGH	MEDIUM	LOW
RISK	1	5	14	9
	2	0	13	16
	3	5	10	13
	4	4	7	16
	5	3	4	21
	6	2	6	17
	7	3	1	23
	8	1	3	23
	9	0	0	27
	10	2	3	22
	11	2	8	17
	12	1	4	20
	13	2	6	19
	14	1	2	24
	15	2	7	18
	16	0	4	22
	17	1	4	22
	18	4	1	24
	19	1	10	16
	20	6	6	15
	21	1	6	21
TOTAL		46	119	405

APPENDIX 9 : RISK/CONTROL MATRIX

CONTROL NUMBER	RISK NUMBER 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	WWWBBCCCC CCGPPPFF	BBGPPFF CCCCCC		G	C			WGCCCC FFBG	CB	BB										BB	
2			WFCF BBBBBBB	BBB WWCP	B		WCBBB			FC	WB	BCC	WCBB		B		WBP	B	WB	CB	CBP
3			BB	WCCCCBB BBBBPPPFF	F		WCC			G			GBB						BP		
4					B	C			C						C			BP		CBC	
5					G	CB	B														
6						C	P			P			P					W			
7					FBBB	WCBBB	BB	PB					C							W	
8					BB					CBB	C	WB				C	C	P			
9														WGCF BBBB BBBPC		WWCP					
10																B				W	
11								W	W					WCCCC FBBB PB		B					
12																					
13												C			WB	WGCCP FFBBB	C	W	CBB		
14			W				C		GFB		PB	C	CC		GCCCCP FFBBBBB		WCCPBB	B			PFB
15			W		C					WFBC	CFC BBBBB	FBBBC			BC	BC	BC	BB	WCB	W	WFCBBB
16		P			CCB		B			BB	CBB	CPB					WGF		CCPB	CCB	
17						W	F			BB		B	WB		WB			B			
18			B	B	WCCPBB	C			PC		GF	GC					B	GCCFFB	GFCBB	GCCPFB	CB
19							P		WWCCFB				B								
20							W		C	WC											
21					PC		C										F	B	F		
22						GCFPP BBBBB		CB			W		B								
23											C			W		C					
24			GPCCCCBB		W					WCB	WCBB	WB	FB		B		CB		WB	B	WWCCCBBB

KEY: W = WHITE = PRODUCER BOARDS
G = GREEN = BANKS
C = CANARY = SOE'S

P = PINK = INSURANCE COMPANIES
B = BLUE = PUBLIC LISTED COMPANIES
F = BUFF = GOVERNMENT DEPTS.