

JOURNAL OF INDUSTRIAL BUSINESS & ECONOMIC RESEARCH

ISSN: 1118-9487



A Publication of Markowitz Centre for Research & Development

On Amman 1011

The Department of Economics, University of Perihanolun

MANAGING RISK IN NIGERIAN COMMERCIAL BANKS

by

Emeka J. Okereke

Dept. of Finance & Banking,
University of Port Harcourt, Rivers State.

Introduction

Banks are financial institutions involved in the business of receiving money and other valuables from the banking public for the purposes of maximizing the banks' primary and secondary objectives. In the course of these business operations, just like any other economic activity, risks are ignited. This makes risk inevitable concept in the life of any undertaking including banking. It arises as a result of the uncertainties inherent in the business world. It is rather an unhealthy phenomenon, as it affects not only the earning power of the business but also involves loss of life and property. No matter how careful, prudent and articulated a person(s) may be, it is rather impossible to eliminate perils associated with economic activities like banking. It comes in different ways and in different names depending on the nature, type, and scope of operation of the entity. Banks in the same class, say commercial banks, with the same asset base and paid-up capital will have different types of risk as long as

they carve out different investment niches for themselves. The more banks expand in operations the more their risk exposures and the more their expected return, *ceteris paribus*.

Risk is always associated with return. This is because a business is said to be risky if there is uncertainty about the expected return. That is, actual return shifted or deviated from the expected return. The closer the actual is to the expected, the less the risk and the less the return. This is also called the risk-return-rule. Risk can therefore be defined as the variations in return arising from business activities. Banks' projections are not always realized because of economic recession, changes in interest or exchange rates, union confrontations, management incompetence, etc. These factors form major sources of risk for banks and are named after them, example, business/economic risk, management risk, union risk, etc. These risks, as earlier mentioned, are inevitable. Therefore, effort is made

here to identify management strategies for reducing, if not eliminating, financial losses arising from these risks, as they pose greater obstacle for the survival of banks especially in the current competitive and highly automated business environment.

RISK MANAGEMENT IN BANKS: AN OVERVIEW

Banks are sometimes confronted with collapse of their business building, sudden attack of armed robbers leading to loss of valuables including cash, fraudsters duping the bank, unacceptability of new product/service, etc. These are risks and will lead the bank into serious financial loss and may threaten the survival and growth of the bank. It calls for effective management of risk using various techniques or methods. Thus, risk management is a process involving the application of management concepts and techniques, and the attendant methods, procedures, facilities, rules and regulations that ensures the reduction of the threat of financial loss arising from the controllable and uncontrollable events of a banking business. The objective of risk management is, therefore, to reduce the adverse effect of economic risk at the least cost consistent with set goals of the bank. Essentially, it is the objective of the bank to maximize their expected return while at the same time minimizing the expected

risk. Going by the risk-return-rule, there is a conflicting objective, that can only be resolved and a balance maintained through risk management efforts. Risk management efforts of banks must accommodate their profitability, liquidity, prudential and social requirements. According to Nzotta (1999:322) any risk management effort of the bank must be in line with profitability, liquidity and prudential requirements.

RISK MANAGEMENT PROCESS

Generally, risk management as a process involves a number of steps. According to Williams and Heins (1976) in Okereke (1995:314), five steps are identified as follows:

1. Establishment of procedures and communication throughout the organization to allow for a complete inventory and discovery of the potential (economic) risks that may arise in the activity of the business firm.
2. Proper measurement of the losses associated with these risks.
3. Consideration of alternative solutions or tools of risk management and the choice of the best tool or combination of tools.
4. Establishment of the means for effective implementation of the decision made.

5. Monitoring and evaluation of the decision reached.

Step 3 above depicts the fact that different approaches or tools to risk management in banks abound. Accordingly, they include:

- a. Avoidance of risk
- b. Minimization of risk through good management techniques, eg. Safety programme security patrol in a business premises, say, for 24 hours.
- c. Absorption of risk or losses, that is, retaining risk internally.
- d. Shifting of risk to another party usually insurance companies. That is, the purchase of insurance to pay for losses.

The choice of any of these tools depends on the cost-benefit analysis and the objective which the bank wants to achieve. Generally, banks are involved in the use of almost all the tools above depending on the level and type of risk. Most times, they are used simultaneously for different types and levels of risks. Flanagan and Norman (1993:46) identified a number of processes which a good risk management system should adopt and adhere. They include:

- a. Risk Identification
- b. Risk Classification
- c. Risk Analysis
- d. Risk Attitude
- e. Risk Response

These procedural steps to risk management are similar to that of Williams and Heins. However, we are going to adopt this for purposes of clarity and understanding and it's going to take the remaining part of this paper.

Risk Identification

This involves the process by which banks systematically, conscientiously and continuously identifies sources of risk exposures before or after they have occurred. It is economically suicidal for a Bank Manager to ignore the sources of possible financial losses. Unless the major and minor sources of potential losses confronting the bank are discovered, the bank may not be opportuned to determined the best way of managing the undiscovered risks and therefore is in serious danger of distress or eventual failure. The implication is that a bank may be retaining a risk when it is supposed to be shifted to an insurance company. This is what we can call tool mismatch in risk management. It is an unhealthy development for the survival of banks. It calls for proper and timely identification of risk. A bank can adopt a number of methods to identify the different loss exposures concerning it's activities as follows: Interaction with Outsiders Method, Financial Statement Method, Onsite Inspection Method, Contract Analysis Method, Statistical Records of Losses Method, Environmental Analysis

Method and Employment of Outsiders Method (Ikeagwara, 2000:4).

A number of banks' sources of risk has been identified by different authors depending on their knowledge and understanding of the operations of banks at various levels. Winiinger (2000:3-4) identified the following:

Strategic Competitive Risk: This is the risk arising from changes in technology, eg., E-Commerce) which will make banks to be caught off guard and unable to anticipate new forms of competition or to respond to them in an appropriate way.

Strategic Adjustment Risk: Which is the possibility that banks will misjudge the degree to which electronic banking will supercede more traditional forms of banking.

Operational Risk: Which is the increased exposure to technological failure. There is the possibility that the computers and network technology that support the e-commerce, for example, could malfunction.

Okereke (1997:88-90) identified a number of sources, among others, as:

Purchasing Power Risk: This arises from an unanticipated increase in the rate of inflation. It is the drastic reduction in the real value of a bank's

assets. It is the erosion of capital by inflation.

Default Risk: Which is as a result of the inability of borrowers to service their debt or/and pay the principal as at when due. It is also called Credit Risk.

Foreign Exchange Risk: This risk arises from the variability of changes (fluctuations) in exchange rate. It is also called Currency Risk.

Security Risk: This is the risk arising from vandalization of banks' installations by hoodlums.

Hempel and Simonson (1991:257-9) identified four primary risks of banking associated with raising of funds as:

Liquidity Risk: Which is the probability that depositors or lenders of funds to the bank will want to withdraw their funds from the bank. This risk may also arise due to poor synchronization of funds by management.

Interest Rate Risk: This is the loss experienced as a result of a banks' fixed income security or any interest rate-bearing investment as a result of changes in interest rate after a purchase has been made. The interest rate risk associated with bank sources of fund depends heavily on the interest sensitivity of the assets financed by these funds.

Credit Risk: This is as explained in default risk above. This type of risk occupies the largest proportion in the risk profile of banks. It is one of the basic reasons for institutionalizing the **BASLE ACCORD** in 1988 (FRBNY, 1998:3-5), whose aim is to identify and promote prudent risk assessment and control practices by banks of (FRBNY, 1999:6-7).

Capital Risk: This indicates how much assets value may decline before the position of its depositors and other creditors are jeopardized. Thus, a bank with say 12% capital-to-assets ratio could not be compared with another with say, 5% capital-to-assets ratio when the values of their assets start declining.

Jones (1991:149-150) identified four sources as:

Market Risk: This is the variability in return of a bank due to fluctuation in the aggregate stock market (or the market as a whole) caused by a range of factors like recession, wars, changes in investors expectation about the overall economic performance, structural changes in the economy, etc.

Inflation Risk: This is the chance that the purchasing power of invested currency will decline. It is likened to purchasing power risk. With certain inflation the real return involves risk even if the normal return is safe as in fixed income assets like treasury bills.

Business Risk: This is the risk of doing business in a particular industry or environment for instance, a bank that carries out its business in a crime-prone area faces the risk of being attacked by hoodlums. This type of risk is also referred to as the variability of uncertainty of a bank's earnings before interest and taxes caused by general economic depression.

Financial Risk: This is the risk associated with the use of debt financing by banks. The larger the portfolio of assets financed by debts as opposed to equity, the larger the variability on the returns of shareholders, *ceteris paribus*. It is the risk resulting from leverage.

Winger and Frasca (1991:115) also identified:

Economic Performance Risk: This is the return variability caused by changes in real output of the economy. Assets returns are influenced by the overall performance of the national economy. A sluggish economy over a long period of time inevitably leads to poor investment returns.

Nzotta (1999:322-5) identified the following, among others:

Loss of Confidence Risk: This relates to loss of confidence in the bank by depositors, the general public and the regulatory authority. Once

the confidence is eroded, the banking super structure collapses.

Operating Risk: This is the risk that banks' operating expenses may exceed their operating revenue, such that they are unable to survive in the long-run and thus may be faced with collapse. Losses of different nature to the Bank escalates its operating expenses and hence, its operating risk.

Funding Risk: This is the risk that a bank will be unable to purchase or otherwise obtain the necessary funds to meet its maturing obligations.

Fraud Risk: The risk that arises from weak interest control measures. It can come from deliberate deception, embezzlement, outright theft, etc.

We can also identify the following:

Judgmental Risk: This is the risk arising from the inability of banks to judge and quantify the level of risk in any investment opportunity. For the banking public, they also face the risk of judging the risk of banks. This, according to Morgan (1997:1) is called Opaque.

Advertisement Risk: This risk emanates from the choice of the wrong advert agent leading to public misinformation or ineffective communication concerning the public and consequently non acceptance of such product. This risk is evident

especially in the wake of highly competitive banking environment.

Trade Union Risk: This is the variability in the banks' return caused by trade union activities and actions (e.g. strikes, Lockouts, etc.).

International Trade Risk: This arises from international trade transactions. Banks in international banking will face this risk. Changes in policies of one country may effect international banking operations adversely. It is also called country risk.

Judiciary Risk: This is the risk arising from court orders.

Hantshel and Smith (1996) in Morgan (1997:5) identified agency risk which refers to the risk that traders will act in their own interest rather than in the interest of managers and shareholders.

Other types of risk can be identified depending on the banks operations and exposure to financial losses in such transactions.

Risk Classification

Risk classification precedes risk identification. Classification of risk helps in the analysis and choice of the best 'treatment' tool(s). Flanagan and Norman (1993:51-55) pioneered three classifications as:

- i. **Identifying the consequence:**
This looks at the frequency,

- severity and predictability of the risk.
- ii. Type: This classification is based on whether a risk is pure or speculative; static or dynamic; and fundamental or particular.
- iii. Impact: This classifies risks based on who bears the effect. It may be the bank (company) the individual or the banking industry/market.

We can illustrate the various types and the impact of risk within the banking industry.

RISK ANALYSIS

This is one of the major components in the risk management process. The main purpose of this component is to x-ray all possible options and analyze the various outcomes of any decision. This will assist the Bank to take the right risk at the least cost with optimum return.

Risk analysis involves a number of steps. Flange and Norman, (1993:59) identified the following steps:

Step 1: Consider all the various options.

TABLE 1: TYPES AND IMPACT OF RISK IN THE BANKING INDUSTRY

EVENT	TYPES OF RISK	IMPACT OF RISK
Management inability to take the right investment decision	Static risk Speculative risk	Bank (Company) risk
Failure of the credit manager to identify a technical defect in a loan contract.	Static risk	Bank (Company) risk
Default in Loan Payment by a Customer.	Speculative risk	
Strike action by bank workers	Pure risk Static risk	Bank (Company) risk
National strike action by all Bank workers	Pure risk Static risks	Industry/Market risk
Injury caused by an accident in or out of the bank premises	Particular risk Pure risk	Individual risk
Increase in exchange rate	Dynamic risk Speculative	Industry/Market risk
Reduction in revenue caused by the Bank's inability to change to new technology.	Dynamic risk	Bank (Company) risk

Source: The Author's Design

Step 2: Consider the risk attitude of the decision maker (Is he a risk averter, lover, or neutral?).

Step 3: Consider what risks that has been identified, which are controllable and what impact is likely.

Step 4: Measure the risks using both quantitative and qualitative techniques. This will help to access the impact of the risk.

Step 5: Interpret the result of the analysis and develop a strategy to deal with the risk.

Step 6: Decide what risk to retain and what risks to allocate to other parties.

Of all these steps, the forth step, risk measurement, is most critical and not only qualitative but also highly quantitative and therefore require further treatment.

RISK MEASUREMENT

This is the process of determining the frequency or likelihood of a loss from an exposure and the possible severity associated with such loss (risk). Banks should measure loss exposures in order to:

- 1) Determine their level and possible effect.
- 2) Obtain relevant information leading to choice of the best risk management tool(s) or combination of them.

3) Generate information that will categories the risk class of their assets portfolio.

4) Generate information that will determine whether or not, bank is meeting the standards sets by monetary authorities on certain risk exposure associated with their operation vis-à-vis their capital base.

The above points explain the fact that once a bank is able to obtain a good measure of their risk exposure, the choice of a management tool or strategy becomes easy.

Essentially, risks are associated with variability. It becomes normal for risks to be measured by such techniques (tools) as range, expected value, variance, semi-variance, covariance and standard deviation. The application of any of these tools depends on the type of risk involved. For instance, foreign exchange risk is best measured by variance analysis, portfolio risk by standard deviation, etc. Ratios are also good risk measurement tool. Nigerian Banks and Central Bank of Nigeria (CBN) majority use ratios in measuring the risk exposure of bank, as we shall see later.

Hempel and Simonson (1993:62-3) identified the following ratios:

- 1) $\frac{\text{Short Term Securities}}{\text{Deposits}}$ for measuring liquidity risk

This ratio refers to a comparison of a banks' liquidity needs for deposit outflows and loan's increase with its actual or potential sources of liquidity, from either selling an asset it holds or acquiring additional liability by sourcing more deposits. This is also called liquid asset-Deposit ratio expressed as

$$\frac{\text{Liquid Assets}}{\text{Total Deposits}}$$

- 2) Interest-Sensitive Assets:
Interest-sensitive liabilities
 for measuring Interest Rate Risk.

Interest-sensitive assets are made up of short-term securities and all variable-rate loans and mortgage (floating rate assets) and interest-sensitive liabilities include transaction deposits, short term and savings deposits and borrowing. These are also called floating rate liabilities and fixed rate liability.

- 3) *Credit Risk = Medium-quality loans/Assets*

Medium quality loan refer to past-due loans or loan losses. This credit risk measurement is also called loan-asset ratio. Other ratios for this same purpose include loan-deposit ratio, loan capital ratio, among others.

- 4) *Capital Risk = Capital/Risk Assets*

Banks' risk assets include loans and long term securities.

This is called capital adjusted ratio or capital ratio or risk-based capital ratio. This ratio is derived by assigning risk weight to the total assets of the bank (categorised). This is in line with the standard of the Basle Accord on capital requirements for banks.

Accordingly, banks are expected to support its asset portfolio with a standard capital base. For instance, 2002 fiscal year has the minimum ratio of capital to total risk-weighted assets at 8 per cent (Ciroma 2002:23-26). So if we apply this ratio, and a bank has say, ₦20 million worth of financial asset (say commercial papers) with a risk weight of 50 per cent according to the guidelines, this amount (₦20 m) will count as ₦10 million (i.e. ₦20 x .5). To support this asset of ₦10m, the bank need capital base of at least ₦800,000 (i.e. 08 x 10 million). This example applies to any other asset category as shown in Table 1 below. One can observe that the less the risk associated an asset (according to weight), the less the capital required to back up such asset and vice versa.

Table 1: A Sample of Risk Weighting Assets Under the Standards.

Asset Category (Examples)	Risk Weight %(a)	Risk-based Capital Ratio\ % (b)	Actual Capital Regained ((a) x (b))
Cash	0	8	0.0
Owner occupier or Residential Mortgage	50	8	4.0
Off Balance sheet items	20	8	1.6
Fixed Assets	100	8	8.0

Source: Oluyem SA (1996) "The Implications for Banks' Profitability of Implementing the Risk-Based Capital Requirements." *NDIC Quarterly*, Vol. 6, Nos. 1 & 2, March/June.

Thus, using the capital adjusted ratio, in measuring the risk inherent in a bank, one can know whether such a bank is capitalized or undercapitalized in the Nigerian context. So dividing core-capital¹ by aggregate of the individual weighted assets² we generated risk based capital ratio. The range of the ratio will place the bank's health position. The Table 2 below classify banks based on the risk-based capital ratio.

From the table 2, one will observe that Nigerian capital threshold begins with adequately capitalized, which implies real total risk-based asset of the bank must have a minimum of 8% (8%) of such asset as capital to back it up. If it is less than 8 percent (<8%), the bank is classified as undercapitalized. The 8% is applied to the 'individual' and 'total' assets of the bank. This is unlike in United States where 4% is

Table 2: Capital Threshold and Bank Classification Under Prompt Corrective Action

Capital Threshold	Total Risk -- Based Capital	Tier 1 Risk Based Ratio	Tier one leverage Ratio
Well capitalized	10%	6%	5%
Adequately capitalized	8%	4%	4%
Undercapitalized	8%	4%	4%
Significantly Undercapitalized	6%	3%	3%
Critically under-capitalized	2%		

Source: Raj Aggarwal and Kevin T. Jacques (1998) "Assessing the Impact of Prompt Corrective Action on Bank Capital and Risk", *FRBNY Economic Policy Review*, Vol. 4, No. 3, P. 24.

used for individual assets to be classified adequately capitalized.

Risk Response

This involves choosing the most desirable risk management tool for dealing with any risk identified, classified and analyzed in the course of bank's operations. As enumerated earlier in this paper, a bank manager can respond to risk by avoidance approach, minimization or reduction approach, absorption or retention approach or transfer approach. The choice of any of these approaches depends on the outcome of the identification, classification and analysis done by the manager.

Risk Absorption or Retention

This is an approach used for managing risk that may prove uneconomical to be transferred. Such risks produce individually small and repetitive losses over a period of time. Retention or absorption of risk requires that the bank must adopt a self-insurance approach. For instance, the risk of public confidence can be treated by increasing capital base of the bank. Also agency risk can be managed through increased capital resources of the bank. The risk of non-performing loans can be managed by improving on investment advisory efforts and bad debt recovery strategies of the bank. Also to enhance profitability, liquidity level and capital adequacy level, internal and cost control measures

must be in place. Operational Risk or the risk of computer failure can be retained by establishing a back-up computer systems supported by infrastructure at the contingency sites rather than the primary site. Foreign exchange risk can be absorbed through hedging. It therefore follows that risk absorption in banks requires that banks resources be managed by putting in place corrective and control measures consistent with the needs of the circumstance.

Risk Reduction

This is one of the risk management tools that involve minimization of bank risks through good management techniques. Essentially, banks can reduce its risk, among others, by;

- Constantly motivating the workforce
- Diversification of investments opportunities
- Merger and acquisition
- Adopting result-oriented loan recovery strategies.
- Using derivative market instruments like forward contracts, options, SWAPS, etc.
- Installing security devices like fire alarm system, in circuit camera, burglary alarm system and other safety programmes.
- Adopting more of short term lending strategies in loan portfolio.
- Investing in financial asset of high performing and reputable firms.
- Adopting hedging techniques.
- Availing themselves of the services rendered by the Central Bank e.g.

lender of last resort in times of distress, offering discount window facilities, etc.

Risk Transfer

This involves shifting the bank's risks to another party, who is assumed to be an expert in the management and control of such risk(s). Insurance is one of the commonest sources of risk transfer in the Nigerian banking industry. Here, banks purchase insurance to pay for the possible losses incurred in the course of their business operations. Basically, not all risk is transferable. Banks respond to risks associated real assets, burglary, deposits, etc. by transferring them to an insurance company, government deposit insurance company (NDIC) or by guarantee of government and their agencies example, the NEXIM - Bank's scheme.

Risk Avoidance

This involves sloping away from taking risk. It is total refusal to go into venture for instance the banks' policy of not going into a certain investment opportunities, the return not withstanding. Also a bank can refuse to enter into a loan (syndication) or any other business agreement and if it must be involved in such contract agreement, it can use exemption clauses to avoid certain risks inherent on such agreements.

Conclusion Banks are enterprises involved in risk taking. They accept

deposits from the banking public, extend loans to borrowers involved in international business transactions, invest in securities, etc. These activities expose them to financial losses, which if not well handled will lead to distress and possible failure. It requires articulated ways and means of reducing, if not, eliminating such financial losses. Risk management techniques are reliable way out. It enables banks to manage their risks in the most economic and efficient way. This paper has synoptically articulated some of the techniques available to banks in managing their risks. It is hoped that these tools if applied with wisdom would go a long way in helping banks to achieve their profit maximization objective as well as wealth maximization of shareholders.

Let us finally conclude with the following risk management tips. Always ensure that risks are matched with returns. This implies avoidance of funds mismatch. Diversify the use of risk management techniques. Two or more techniques can be used in one risk exposure.

Don't use a technique mainly because it worked for Bank A

You must consider your immediate environment and circumstance, among others.

Insist on matching the duration or maturities of bank's assets and liabilities.

Use your intuition in your risk management efforts.

Ensure that the right technique is applied to the right risk. This is to avoid tool mismatch in your risk management efforts.

Check the risk exposure on a continuous basis, as the market is prone to fluctuations.

Flanagan and Norman (1993:24) listed some rules for risk taking by banks as follows:

- Don't risk a lot for a little
- Always plan ahead
- Always analyze both the source and the consequence of risk
- Devise alternative action as a contingency measure
- Don't use other people as an excuse for inaction.
- Don't take risks purely for reasons for principle
- Don't take risks to avoid losing face.
- Never risk more than you can afford to lose.
- Be prepared to seek advice from experts
- Consider the odds and what your experience and intuition tells you.
- Consider the controllable and uncontrollable parts of the risk.

Notes:

1. Capital may be primary (core) or secondary. The primary or core capital is sometimes called Tier 1 capital and is mostly emphasized by the new capital adequacy standards. It consists of paid up capital and disclosed reserves (general and statutory). The

secondary or supplementary (Tier 2) capital consists of undisclosed reserves, asset revaluation reserves, etc.

2. Individual weighted assets is expressed as

$$\begin{aligned} & \text{Total Weighted Asset (TWA)} \\ & = \Lambda_1 W_1 + \Lambda_2 W_2 + \dots + \Lambda_n W_n \\ \text{TWA} & = \sum_{j=1}^n \Lambda_j W_j \end{aligned}$$

Where TWA = Total weighted Asset

j
n = number of assets owned by the bank

Λ_j = Asset j

W_j = Weight assigned to Asset. The weight is determined by CBN based on the risk class of the asset.

= Sum of j from 1 to n

References

- Ciroma Adamu (2002) "Monetary, Credit, Foreign Trade and Exchange Policy Guidelines for 2002/2003, *Business Times*, January 14-20.
- Emeagwara C. (2000), Risk Management in Banks, Seminar Paper Presented to the Department of Finance and Banking, University of Port Harcourt.

- Flamagen, R. and Norman, G. (1993) *Risk Management and Construction*, Oxford: Blackwell Scientific Publication.
- Hampel, G. H. and Simonson, D. G. (1991) *Bank Financial Management: Strategies and Techniques for a Changing Industry*, New York: John Wiley and Sons Inc.
- Hentshel, L. and Smith, C. (1996) In Morgan, P.D. (1997) Op. Cit.
- Jones, C. P. (1991), *Investment Analysis and Management*, 3rd New York: John Wiley & Sons Inc.
- Nzotta, S. M. (1999) *Money, Banking and Finance: Theory and Practice*. Owerri: Intercontinental Educational Books and Publisher.
- Morgan, P. D. (1997) "Judging The Risk of Banks: What Makes Banks Opague", Research Paper No. 9805, Federal Reserve Bank of New York.
- Okereke, E. J. (1997) *Dimensions of Project Evaluation*, Owerri: Avan Global Publication.
- Wenninger, J. (2000), "The Emerging Role of Banks in E-commerce", *Current Issues in Economics and Finance* FRB, New York, Vol. 6, No. 3.
- Williams C. A. and Henins R.M., (1976) in Okereke (1995) "Risk Management and Insurance", in Baridam Don (1995) *Business: A Management Approach*, Paragraphics, Port Harcourt.
- Williams J. McDonough (1998) "Issues for the Basle Accord", *Annual Report 1998, Federal Reserve Bank of New York, September, 22.*
- _____ (1999) *Global Financial Reform: A Regulators Perspective*", Annual Report 1999, FRBNY, Nov. 17.
- Winger B. J. and Frasca R. R. (1991), *Investments: Introduction to Analysis and Planning*, 2nd ed. New York: Macmillan Publishing Company.