Allied Academies
International Conference

Nashville, Tennessee
April 10-13, 2002

Academy of Commercial
Banking and Finance

PROCEEDINGS

Table of Contents

STOCK RETURNS AND INFLATION IN THE EMERGING CAPITAL MARKET: EVIDENCE FROM JORDAN

Osamah M. Al-Khazali, American University of Sharjah

ABSTRACT

Using a vector-autoregression (VAR) approach, this paper investigates the relation between stock returns and inflation in the emerging market economy Jordan. The Fisherian assumption that the expected nominal return on common stocks consists of a "real" rate plus expected inflation is soundly rejected for each stock market under study. The results of the VAR model indicate the lack of a unidirectional causality between stock returns and inflation. It also fails to find a consistent negative response neither of inflation to shocks in stock returns nor of stock returns to shocks in inflation.

INTRODUCTION

The purpose of this paper is to examine the relationship between stock returns and inflation in the emerging market economy Jordan. From the beginning, tests of the stock return-inflation relationship yielded mixed results. Most researchers have found evidence that counters the stock return-inflation relationship. Results of empirical studies have shown that expected inflation, changes in expected inflation, and unexpected inflation are negatively correlated to stock returns (Bodie, 1976; Fama & Schwert, 1977; Gultekin, 1983a; Jaffe & Mendelker, 1976; Kaul, 1987; Lee, 1992; Marshall, 1992; Nelson, 1976; Solnik, 1983; Khil & Lee, 2000). However, Kaul (1987), Boudoukh and Richardson (1993), and Martin, Evans, and Lewis (1995) report that when stock returns and inflation are evaluated over a longer time period, the Fisher hypothesis cannot be rejected. Even for a short time covering the post-war period, Firth (1979) and Gultekin (1983a) find that the relationship between nominal stock returns and inflation in the United Kingdom is reliably positive, which is consistent with the stock return-inflation relationship.

Practically all empirical studies concerning the stock return-inflation relationship have primarily focused on the U.S. and European economies; with a few studies covering the Pacific-rim economy. No published work relating the Fisher hypothesis in the Jordanian economy was found in the course of this study.

The focus of this paper is to investigate the relationship between common stock returns and ex-ante inflation in Jordanian economy. Also the general efficiency of capital markets is evaluated. More specifically, such efficiency is determined by testing whether or not stock prices are fully adjusted to expected inflation. In addition, causal relations and dynamic interactions between stock returns and inflation are examined by applying the vector autoregressive (VAR) model. The remainder of this paper is organized as follows: Section 2 discusses some theoretical considerations

and the Fisher hypothesis, Section 3 explains the data, Section 4 describes the VAR analysis, Section 5 discusses empirical results, and Section 6 summarizes.

THE FISHER HYPOTHESIS APPLIED TO COMMON STOCKS: THEORY

Fisher (1930) in his seminal work on interest rates suggested that the nominal interest rates fully reflects the available information about the future values of the inflation rate, and thus, the nominal interest rate can be expressed as the sum of an expected "real" rate and an expected inflation rate. This proposition, also known as the Fisher Effect or the Fisher Equation, has been widely accepted among financial economists and can be generalized to rates of return on common stocks and other assets. Fama and Schwert (1977) explain the stock return-inflation relationshipeffect such that the market, if it is efficient and reflects all the available information at time t - 1, will set the price of common stocks so that the expected nominal return from t -1 to t is the sum of the appropriate equilibrium expected real rate and the market's assessment of the expected inflation rate for the same time period. Formally,

$$E(R_t/\Phi_{t-1}) = E(r_t/\Phi_{t-1}) + E(\pi_t/\Phi_{t-1}) \tag{1}$$

where R_t is the nominal return on an asset, $E(r_t/\Phi_{t-1})$ is the equilibrium expected real return, and $E(\pi_t/\Phi_{t-1})$ is the expected inflation rate; i.e., the market uses the information set Φ at t -1 to assess the expected rate of inflation and to determine the expected real return on common stocks with an appropriate risk premium. Then the market sets the price of common stocks such that the expected nominal return is the sum of the equilibrium expected real return and the best possible assessment of the expected inflation.

Fisher believed that the real and monetary sectors of the economy are independent. Thus, he hypothesized that the expected real return on interest rates is determined by real factors such as the productivity of capital and time preference of savers, and that the expected real return on interest rates and the expected inflation rate are independent. This assertion obviates the need, otherwise, for a complete general equilibrium model for the expected real returns.

Like previous empirical research on this topic , this study tests the joint hypothesis that the market is efficient and that the expected real return on common stocks and the expected inflation rate are independent and can be obtained from the following standard regression model:

$$R_t = \alpha + \beta E((\pi_t/\Phi_{t-1}) + \varepsilon_t \tag{2}$$

The regression model in Equation 2 estimates the conditional expected value of the stock market return as a function of the expected inflation rate. Provided that the expected inflation rate can be estimated, an estimate of β is statistically indistinguishable from unity and is consistent with the hypothesis that the expected nominal return on common stocks varies in a one-to-one correspondence with the expected inflation rate. As stated earlier, the latter implies that common stocks are a complete hedge against expected inflation. Furthermore, the expected real return on an asset is equal to its expected nominal return less the expected inflation rate. Thus, an estimate of

ß that is indistinguishable from unity is also consistent with the hypothesis that the expected real return on stocks and the expected inflation rate are independent.

As reported in the studies of Fama and Schwert (1977), Gultekin (1983a), and Solnik (1983), interest can be focused on expected and unexpected components of the inflation rate and their influence on stock returns. Therefore, to capture the impact of the unexpected component of the inflation rate on common stock returns, Model 2 is expanded as follows:

$$R_t = \alpha + \beta E((\pi_t/\Phi_{t-1}) + \gamma[\pi_t - E(\pi_t/\Phi_{t-1})] + \varepsilon_t \qquad (3)$$

where $E(\pi_t)$ is the expected component of inflation and $\pi_t - E(\pi_t/\Phi_{t-1})$ is the unexpected component of inflation. β and γ are the regression coefficients. An estimate of the regression coefficient γ, that is statistically indistinguishable from 1.0, is consistent with the previous hypothesis that on average the nominal return on common stock varies in a one-to-one correspondence with the unexpected inflation rate.

Since the unexpected rate of inflation is, by definition, uncorrelated with the expected rate of inflation, Model 3 produces tests of the Fisher hypothesis that $\beta = 1.0$, with results that are identical to those that would be obtained from Model 2. When $\gamma = 1.0$, the common stock returns are a complete hedge against unexpected inflation. When the tests suggest that ß=γ= 1.0, one can say that the common stock return is a complete hedge against inflation. The nominal return on the common stock varies in a one-to-one correspondence with both the expected and unexpected components of the inflation rate, and the ex-ante real return on the common stock is uncorrelated with the ex-ante inflation rate.

DATA

Monthly stock market returns and prices, monthly consumer price index (CPI), and monthly short-term interest rates, money market rate, were obtained from International Financial Statistics (IFS), published by the International Monetary Fund and from the Central bank of Jordan (CBJ). Monthly inflation rates were calculated as the change in the consumer price indices. The data set covers the period from January 1978 through December 1999.

METHODOLOGY : CAUSALITY AND VECTOR AUTOREGRESSION (VAR) ANALYSIS

This study attempts to determine the causal relations between stock returns and inflation in the Jordanian economy. The empirical tests are based on the Granger causality tests. These are essentially tests of the predictive property of time series models. A time series Y (inflation) predicts another time series X (stock returns) in the Granger sense if present X can be predicted better by using past values of Y than by not doing so, considering also other relevant information, including

past values of X. More specifically, X is said to cause Y, provided some ci is not zero in Equation (4),

$$Y_t = a_0 + \sum_{i=1}^{k} b_i Y_{t-i} + \sum_{i=1}^{k} c_i X_{t-i} + \eta_t \ . \tag{4}$$

Similarly, Y is causing X if some ci is not zero in Equation (5),

$$X_t = a_0 + \sum_{i=1}^{k} b_i X_{t-i} + \sum_{i=1}^{k} c_i Y_{t-i} + \eta_t . \tag{5}$$

The test of the null hypothesis that X (Y) does not cause Y (X) is a test that $c_i = 0$
for $i = 1, 2, \ldots , k$.

In addition to employing the simple and multiple regression analyses, this study also applies the vector autoregressive (VAR) model.   Empirical causal relationships are examined under the VAR framework, which treats all variables within the system as endogenous. Essentially, such an approach estimates a system of structural equations under an unrestricted reduced form. The system's responses to random shocks are traced by the decompositions of variance or error term and innovation accounting. At the same time, the dynamic interactions among the variables of the system are examined by analyzing the impulse response function. Such a nonstructural (or as some argue, semi-structural) model is particularly suited for the purpose of investigating the causal chains within a system of equations. The model sheds light into the exogenity of a variable and reveals the dynamic response of one variable to random shocks in innovations of another variable in the system.

The VAR representation is expressed as follows:

$$A(L)\, x_t = u_t \tag{6}$$

where $A(0)$ is an identity matrix, x_t is a stationary vector consisting of a measure of inflation and other relevant variables, u_t is the innovation vector of x_t, and L is a lag operator. In order to examine the effects of inflation shocks on stock returns, the VAR representation of model 6 is transformed into a moving average (MA) representation as follows:

$$x_t = B(L)u_t = \sum_{s=0}^{\infty} B(s)u_{t-s}, \tag{7}$$

where x_t is a linear combination of current and past one-step-ahead forecast errors or "innovations." $B(0)$ is an identity matrix; $b_{ij}(s)$ is the $(i,j)th$ component of $B(s)$, which represents the dynamic response of each endogenous variable x_{it} to a shock, u_{jt-s} , after s periods; u_t is a vector of unorthogonalized innovations; and the covariance matrix $E[u_t u_t'] = S$ is not, in general, an identity matrix.

Since the study is interested in the MA representation with orthogonalized innovations, it chooses a matrix G such that $G^{-1} \Sigma G^{-1\prime} = I$. This gives a vector of orthogonalized innovations $v_t =$

$G^{-1}u_t$ satisfying $E[v_t \; v_t'] = I$. By using the Choleski decomposition , one can obtain a lower triangular G as a solution to $GG' = S$. Thus one has the following MA representation with orthogonalized innovations:

$$x_t = \sum_{s=0}^{\infty} B(s) \; Gv_{t-s} = \sum_{s=0}^{\infty} C(s)v_{t-s}, \tag{8}$$

where v_t is a vector of orthogonalized innovations. Using Equation 8, impulse responses are derived and confidence bands are generated by Monte Carlo Integration. The coefficients of $c(s)$ represent responses to shock in particular variables. The variance of each element in x can be allocated to sources in elements of v because v is serially and contemporaneously uncorrelated. This allows a definition of the variance decomposition as:

$$\left. \sum_{s=0}^{h-1} c_{ij}(s)^2 \middle/ \sum_{j=1}^{m} \sum_{s=0}^{h-1} c_{ij}(s)^2 \right. \tag{9}$$

where m is the number of variables in x. This measure gives the fraction of error variance in the h-step ahead forecast of x_i, which is accounted for by innovations in x_j.

SUMMARY

Using data between January 1978 and December 1999 from the emerging market Jordan, this paper examines the generalized Fisher hypothesis, which states that the real rates of return on common stocks and the expected inflation rate are independent and that nominal stock returns vary in a one-to-one correspondence with the expected inflation rate. This study conducts an investigation, based on a VAR analysis, of causal relations and dynamic interactions among stock returns, inflation, and expected inflation. Compared to other regression techniques, the VAR analysis, based on innovation accounting, provides a rigorous study of the dynamic relations among the variables without imposing a priori restrictions.

The results of the VAR model indicate the following: (1) nominal stock returns seem Granger-causally a priori in the sense that most of the forecast error variances is accounted for by their own innovations in the three-variable system, (2) inflation does not appear to explain variation in stock returns, (3) stock returns do not explain variation in expected inflation, and (4) the stochastic process of the nominal stock returns could not be affected by expected inflation.

The study fails to find either a consistent negative response of stock returns to shocks in inflation or a consistent negative response of inflation to shocks in stock returns in the Jordanian economy. The generalized Fisher hypothesis is rejected. It appears that the relation between nominal common-stock returns and inflation in the emerging market is as puzzling as the findings in the developed countries.

REFERENCES

Bodie, Zvi.(976). Common stocks as a hedge against inflation, *Journal of Finance* 31, 451- 70.

Boudoukh, J. and M. Richardson (1993). Stock returns and inflation: A long-horizon perspective, *American Economic Review* 83, 1346-1355.

Boudoukh, J., M. Richardson, and R. Whitelaw (1994). Industry return and the Fisher effect, *Journal of Finance* 49, 1595-1615.

Branch, B. (1974). Common stock performance and inflation: An international comparison, *Journal of Business* 47, 120-138.

Fama, E. F. (1975) Short-term interest rate and inflation, *American Economic Review* 65, 269-282.

Fama, E. F. (1981). Stock returns, real activity, inflation and money, *American Economic Review* 71, 545-565.

Fama, E. F., and W. G. Schwert (1977). Asset returns and inflation, *Journal of Financial Economics* 5, 115-146.

Firth, M. (1979). The relationship between stock market returns and rates of inflation, *Journal of Finance* 34, 113-129.

Gultekin, N. (1983). Stock market returns and inflation: Evidence from other countries, *Journal of Finance* 38, 49-65.

Khil, J., and B. Lee (2000) Are common stocks a good hedge against inflation? Evidence from the Pacific-rim countries, *Pacific-Basin Finance Journal*, 8, 457-482.

Jaffe, J. and G. Mandelker (1976). The Fisher effect for risky assets: An empirical investigation, *Journal of Finance* 31, 447-458.

ENDNOTES

[1] Khil and Lee (2000) examined the relationship between real stock returns and inflation in the U.S. and 10 Pacific-rim countries.
[2] The results, tables, charts, references, and complete paper are avaiable upon request from the author. This paper is condensed to fit the proceedings guidelines.
[3] See Fama and Schwert (1977), Solnik (1983), and Martin, Evans, and Lewis (1995).
[4] The stationarity of rate of return on common stocks prevented this study from using cointegration test. In order to test for cointegration between two time series data the following conditions have to be satisfied: (1) the two variables are nonstationary and integrated of the same order, that is, the same

order of differencing is required to produce stationarity; (2) there exists a long-run equilibrium relationship; and (3) the error term is stationary.

[5] See Sims (1980) For detailed discussions.

[6] The standard orthogonalization method used by RATS is the Choleski factorization.

CREDIT RISK MANAGEMENT OF SMALL AND MEDIUM SIZED BANKS: USING CREDIT DERIVATIVES

Donald J. Brown, Sam Houston State University

ABSTRACT

Small and medium sized commercial banks are more adversely impacted by regional recessions than large banks because they lack the ability to efficiently diversify their loan portfolios on a geographic basis. Therefore the credit risk management problems they face may be more severe than those of larger banks because of they are more closely tied to the economic conditions of their local lending area. They may do an outstanding job of diversifying their portfolios across different types of loans but still face a severe concentration problem due to the lack of geographic diversification.   If these banks are effectively servicing their market they can't avoid this problem. The loan-to-deposit ratio may be considered in (CRA) compliance evaluations by bank regulators, and all else the same a high ratio may be considered as evidence of greater compliance.

Traditional credit risk management procedures may not benefit these banks in this specific area. However, there are new derivative products, called credit derivatives that may offer these banks a more effective way to manage this risk. Banks may be able to transfer the risk and returns from a loan or baskets of loans without transferring title to the loans.

INTRODUCTION

Rolling recessions have been a significant factor for U. S. banks over the past 10-15 years. Recessions in oil, real estate, high tech and air and space industries, are examples of these types of recessions. As these industries, and the geographic regions in which they were concentrated experienced recessions, the banks in these areas experienced increased loan default rates, falling profits and increased risk of failure. The fait of banks in these areas was tied to that of these regional or local economies. Bank failures increased in each region as the primary industry experienced slower sales.

Banks were more or less captive to the industry that dominated their geographic market area. Over most of this period interstate banking and branching were not allowed.   Therefore, diversification in relation to the geographic region was more difficult. Some diversification could be accomplished through loan sales and/or purchases but this alternative is more likely associated with larger banks.   In many cases small and medium sized independent banks faced limited opportunities to effectively diversify their loan portfolios. A bank could have a diversified portfolio relative to the type of loans held but still have a very concentrated portfolio because of the lack of geographic diversification. In other words the fact that you have a portfolio which is very well diversified between say, real estate, auto, personal, agriculture and other commercial loans makes little difference if the people and businesses you are lending to are all in some way impacted by the

dominant industry of that banks major market area. For example when the oil industry experienced recession in the 1980's the personal, auto and real estate loans of oil workers experienced increased default risk but so did the loans to businesses, which were suppliers to the oil companies, as well as the loans of their employees. It's like a snowball rolling down hill. The banks, which were unfortunate enough to be located in these regions, may have had little power to avoid the disaster. The change in the interstate banking and branching laws will allow larger banks to more effectively diversify loan portfolios but will offer limited relief for small or medium sized independent banks.

However, credit derivatives may offer small and medium sized banks a method to more effectively diversify their loan portfolios. In theory, credit derivatives allow banks of all sizes and structures, this opportunity, but unless problems relating to risk measurement, liquidity and marketability for their loans can be solved, small and medium sized banks may have limited access to this market. This paper examines the theoretical use of credit derivatives by small and medium sized independent banks to reduce geographic concentration in the loan portfolio and then proposes some possible methods for solving the problems mentioned earlier.

CREDIT RISK MANAGEMENT

Credit risk management problems of small and medium sized independent banks may result from the banks lending policies being inappropriate or from the inappropriate application of the policies by the banks lending officers and management. Additionally, these banks may face credit risk management problems, which are a direct result of the inability of the bank to effectively diversify their portfolio geographically. Credit derivatives are not a viable solution to the problems created in the first case but may be for problems relating to the second case.

TYPES OF CREDIT DERIVATIVES

Credit derivatives are to some degree a relatively new financial product, which are presently in the developmental stage. Credit derivatives are growing rapidly but still represent only about one percent of the overall derivatives market (Kiff 2000; www.financewise). They are the restructuring of other derivatives such as forwards, futures, options and swaps with the underlying asset or assets being credit instruments rather than interest rates, commodities, foreign exchange or equities. There are four major types of credit derivatives being used at the present. The list includes Total Return Swaps, Credit Default Swaps, Credit Spread Options and Credit Linked Notes.

ISSUES THAT NEED TO BE RESOLVED

Credit derivatives complex documentation and the lack of common terminology used in the contracts, have been major concerns in the past (Shann 1998). The ISDA has now produced a more streamlined, and standardized default-swap contract and a set of common terms, which will be used in future credit derivative transactions. Therefore, these issues should cause less concern in the future. These contracts are still relatively complex contracts in many cases, but with a body of

common terminology there should be less concern and less risk from inappropriate documentation (Moser 1998).

Other issues raised by federal bank regulators are still not fully resolved and must be considered in regard to banks usage of credit derivatives. Failures such as Long-Term Capital Management have caused regulators to be less enthusiastic about banks involvement with these new products (Boughey 1998). Nancy Wentzler, Director of Economic Analysis at the OCC, has stressed the need to test these in periods of economic distress and to monitor them as carefully as loans (Boughey 1998). The OCC has adopted a policy of evaluating each banks credit derivatives activity on a case-by-case basis (Moser 1998). They seem to be aware of the potential credit derivatives may hold for efficient risk management and are hesitant to take actions, which could prevent them from realizing their full potential (Moser 1998).

The Federal Reserve has taken a more conservative stance in relation to credit derivatives (Duffee 2000). They have concerns about the lack of market transparency and about how credit derivatives may affect industry systemic risk. The Fed is concerned that the lack of transparency of these markets could cause banks to miscalculate risk (Duffee 2000). There is a lack of data concerning the level of correlation in default rates for differing credit instruments. If the correlation is stronger than anticipated risk, pricing will be inaccurate. Risk could be under priced leading to an over use of credit derivatives and an increased risk of bank failures when adverse economic events occur (Duffee 2000).

The Fed is also concerned about the effect of credit derivatives on systemic risk. Failures of large counter parties, such as Long-Term Capital Management, might lead to a wave of bank failures if a large number of banks have credit derivative contracts with a large institution which fails. The solution to these problems may come as the markets grow and become more liquid. Two new internet trading platforms, were launched in 2000, which could help create additional transparency in the these markets (Kiff 2000). As trading volume increases, and more trading data become available, there should be less concern about the accuracy of risk pricing in the credit derivatives markets. Also, the issue of systemic risk is probably only going to be resolved by empirical data as the markets grow and become more transparent.

THE APPLICATION OF CREDIT DERIVATIVES TO THE PROBLEM

The following is a discussion of how, in theory, banks can use credit derivatives to effectively diversify away geographic concentrations. Bankers Banks can play an important role in helping their member banks in this process. The Bankers Banks may be able to act as the facilitator, in a series of credit switches among their member banks.

Credit switches are an application of total return swaps. In the credit switch two firms exchange a portion of their credit risk and return for the credit risk and return of the other firm. For example, a bank could enter into a total return swap whereby they swap the total risk and return on a portion of their loans for an equal amount of the other banks loans. Each bank would end up with the same amount of credit as they began with but since the swaps would be with a bank outside their geographic area they could have less credit risk. The advantage of the credit switch over loan sales and purchases is that they can be done without notification and therefore, may be less disturbing to

customer relationships, and may create a more diversified portfolio than is possible from individual loan sales or participations. These swaps could be handled outside the framework of the Bankers Bank but would probably be more acceptable to the banks if the Bankers Bank were the facilitator. However that may not always be true. If bankers have an established relationship with others bankers, through loan sales and/or participations, they could simply extend that relationship to credit derivatives. The advantage credit derivatives would have in these cases would be that notification is not required. Their customers need not know that the bank has sold their loans. Additionally, credit switches may require less total paper work and therefore may be more cost effective than outright loan sales or participations.

THE ROLE OF BANKERS BANKS

Rather than matching loans with banks on a one-to-one basis, the Bankers Bank might be able to create a portfolio in which all its member banks could invest. If a Bankers Bank has 100 members each could contribute the total return and risk from a portion of their loan portfolio to a portfolio managed by the Bankers Bank. If they entered into a total return swap in which they transfer the total return and risk of a portion of their loans to the portfolio and in return receive a proportional amount of the portfolios total return they would have a much more diversified loan portfolio. The size of the banks total return swap will be a function of the amount of geographic concentration they have and the level of diversification they seek. For some banks this may mean they will transfer the total return and risk on a small percent of their total loan portfolio and for others it might be a much larger percentage. The greater the domination of their primary lending area by a single industry, the larger the percent of loans they might wish to swap.

If the average sized swap from each member bank is for the total return and risk on $10 million, then the total portfolio held by the Bankers Bank in this example would be for $1.0 billion, (100 X $10 million). Each bank would then receive their proportional share of the portfolios total returns. A bank, which swapped $20 million, to the portfolio, would receive 2 percent of the portfolios total return each year. The total return on the portfolio would consist of principal and interest paid on the loans, minus the losses from defaulted loans included in each banks swap. If the borrowers repaid 20% of the principal, plus 10% interest and the portfolio experienced a .5% default rate then the above banks 2% would be computed as follows; ($1.0 Billion) (.2 + .1 -.005) (.02) = $5,900,000. This would represent their share of the total return and risk from the total portfolio. However, the actual cash flow would likely be the net difference between the above amount and the total return they would be required to pay on the loans they have swapped to the portfolio. If the loans they have swapped have a higher default rate than the average of the portfolio, they will receive a cash payment. If on the other hand, their default rate is less than the average they will make, a cash payment to the fund.

BENEFITS FROM BANKERS BANK PARTICIPATION

The issues discussed earlier, which were listed as likely to cause a problem in applying credit derivatives, can be overcome by the methods suggested above. In other words, the lack of market transparency and the issue of systemic risk will not create the same level of concern about pricing credit derivatives, which are being used in these types of portfolios, as they do in the broader market setting. Also, the liquidity and marketability of small and medium sized independent banks loans would no longer be and issue since the loans would not be offered in the market. However, banks may still need to know the level of default correlation between different types of loans and between loans from different geographic areas in order to know how effective the total return swaps might be in reducing risk.

Default correlation may be relatively high among some Bankers Banks member banks. In situations where there is a high correlation of default among the member banks, additional total return swaps with other states Bankers Banks might be utilized. For example, if the default rate is highly correlated among Texas' small and medium sized independent banks, additional diversification benefits would be gained if their Bankers Bank entered into credit switches with Arkansas, Missouri or other Bankers Banks in other regions of the country. They could enter into credit switches in which they would swap a portion of their total return swaps portfolio for an equal amount of a similar portfolio from the other states Bankers Banks. All banks involved could reduce their risk of failure over the long-term as they reduce the impact of strong regional recessions within their primary service area.

SUMMARY AND CONCLUSIONS

Small and medium sized independent banks credit risk management problems are, to a large extent, tied to the geographic area in which they operate. Traditionally these banks have used loan sales and participations to reduce their geographic concentrations and to comply with the legal lending limits. Credit derivatives may offer a more efficient alternative to the traditional methods. Examples presented earlier show how total return swaps, which are used in credit switches between the small and medium sized banks and their Bankers Banks, can be used to more effectively manage the credit risk that results from geographic concentration and to comply with legal lending limits.

Diversification through the use of credit derivatives could be more cost effective, for small and medium sized banks, than out of market lending and would still allow each bank to fully utilize the comparative advantage they have from lending in the market they know best. Community bankers know more about the character of those they lend to, because they observe them on a daily basis. If they try to go outside their market area they lose this significant advantage and may gain geographic diversification but still not reduce their overall credit risk.

Research is needed to explore and develop the methodology needed to effectively use credit derivatives in small and medium sized banks risk management programs. A legitimate criticism of this proposal is that, yes it looks good on paper but can it be practically applied in the real world of small and medium sized banks risk management. As someone has pointed out in the past, the devil is in the details. However, as Mark Vaughan, of the St. Louis Federal Reserve Bank pointed out to

me, the first proposal for larger banks to use tradable permits to meet their CRA compliance requirements was met with similar criticism. Now, 10 years later, this method is widely used.

REFERENCES

Available on request.

CONTEMPORARY ISSUES IN RISK MANAGEMENT

Guy Ford, Macquarie University

ABSTRACT

This paper draws on a large body of risk management literature and interviews with risk practitioners to identify the most pressing issues facing those responsible for managing risk in financial institutions. We provide insight into three major issues: measuring and pricing extreme value risk, integrated risk management, and dealing with the gap between regulatory and economic risk capital for capital allocation purposes. Most notably, we find an increasing preoccupation on the part of regulators and institutions with measuring high probability/low loss operational risk events, and very little focus on modelling for extreme event risk. We also question a number of the common principles behind integrated risk management. This study was undertaken with financial assistance from the Munich Reinsurance Risk Competency Centre at Macquarie University.

INTRODUCTION

The aim of this paper is to identify key contemporary issues in financial risk management. Drawing from a large body of risk management literature and discussions with a number of risk practitioners, we identify and examine three major risk management issues. These are (1) measuring and pricing extreme value risk; (2) integrated risk management; and (3) dealing with the gap between economic and regulatory capital for capital allocation purposes. While this list is by no means exhaustive, these items featured consistently in our research as major issues facing risk management practitioners.

We find a major focus on operational risk measurement in financial institutions. Until recently there has been a clear lack of consensus regarding the sources and definitions of operational risk among many groups; the Basel Committee of Banking Supervision, a sub-committee of the Bank for International Settlements, has itself only just settled on a definition of operational risk. From a practical perspective, difficulties in determining a standard definition of operational risk have made the task of consistent measurement and effective management virtually impossible.

We find that most of the focus to date, on the part of both banks and regulators, has been on risk scoring systems and deriving operational loss benchmarks. It is our view that these approaches focus almost exclusively on high probability/low loss events such as processing errors and systems outages, and as such, do not come to grips with extreme event risk. This represents low probability/high loss events that defy basic statistical analysis but which are capable of wiping out an institution. Thus threats such as the ability of an individual trader to execute unauthorised trades still remain largely unaccounted for. The following sections examine our findings in more detail.

EXTREME EVENT RISK

The Basel Committee of Banking Supervision defines operational risk as "the risk of direct or indirect loss resulting from inadequate or failed internal processes, people and systems or from external events (Bank for International Settlements, (2001a), p.2). Operational risk has been high on the regulatory agenda of financial institutions since the collapse of institutions such as Barings Bank, Daiwa Bank and the Sumitomo Corporation. This is because the collapse of these institutions has been attributed to poor operational risk management, and not the more traditional risks in trading/banking activities such as credit risk and market risk. Losses in these institutions were largely caused by the actions of single individuals which may have been prevented through appropriate oversight: individuals performed unauthorised trades and concealed losses over long periods of time. In response to a growing concern of poor operational risk controls in financial institutions, in January 2001 the Basel Committee issued a revised consultation paper aimed at providing for a more risk-sensitive regulatory capital profile (Bank for International Settlements, (2001b)). The revised Basel Accord focuses on the causes of operational risk and recommends basic quantitative techniques to calculate a minimum capital charge for operational risk. The Accord allows for banks to move through a series of three increasingly advanced approaches to measuring operational risk, and provides the potential for lower capital regulatory capital requirements with improvements in bank operational risk measurement and management.

The Basel Committee proposals omit reputational risk from the definition of operational risk for the purpose of a minimum regulatory operational risk charge. This is deliberate on the part of the Committee (Basel Committee (2001a) p.2) and indicates, in the first instance, focus by regulators on the more predictable losses that a bank should be able to absorb in the normal course of its business (higher probability/lower loss events). However, many financial institutions are concerned with reputational issues, and in particular, market reaction to news of losses. Managers report that, increasingly, small reported losses can lead to large reactions in share prices - since the large number of financial institution insolvencies in the last decade linked to operational risk, markets tend to react not to the size of the losses, but more the perceived loss of control.

Financial institutions are in the business of selling trust and creditability. Unlike other businesses, their market share is dependent on their credit rating and perception that management are in control of their operations. To the extent that a capital charge for operational risk leads to a tightening of procedures, processes and controls, the risk of losses and consequent reputational effects may be reduced. The capital charge is basically linked to statistical analysis of processing errors, etc and their costs. However, of concern is that the largest threats - extreme event risk and the volatility of reputation risk - may defy statistical modelling. These are the "stress losses" - improbable, but possible, extreme scenarios that the institution must be able to survive (lower probability/higher loss events).

Operational risk is not a new risk: financial institutions have always run an element of operational risk and carried a cushion of capital against it. However, there has been an increase in the susceptibility of financial institutions to extreme events. A number of factors are at play here, such as rapid growth in derivatives activities where some risks have not been fully understood or controlled; greater competition (under deregulation) promoting higher risk-taking and downsizing

of middle management to reduce costs; the gradual shift from traditional intermediation towards a more trading-orientated environment; and a growing concentration of processing risks in some institutions arising from a push to outsource non-core activities. These developments combine with specific attributes of financial institutions to increase the susceptibility to extreme losses that are more difficult to model and provision against. These attributes are as follows: first, the nature of many financial products is that risks may change in nature and intensity from the point of sale: the bottom-line contribution of a transaction is generally uncertain until the contract ends, and this is typically well after employees have been compensated; secondly, financial institutions run on thin margins and high leverage, with changes in the value of assets magnified on the capital base; and thirdly, the high leverage of financial institutions means individuals have the potential to threaten the capital base/solvency of the institution. This is intensified when incentive structures are asymmetrical: rewarding good performance but not penalising bad performance equally.

Models being developed for operational risk capital charges tend to be based on a value-at-risk (VaR) framework (this currently applies to market risks). However, VaR or standard deviation approaches tend to focus on unexpected losses under normal market conditions. Normal market conditions imply that price movements are distributed statistically according to a normal distribution, or that markets will tend to behave in the same way as they have in the past. The problem is that VaR models have not provided a sufficient capital buffer when markets add new data points in the form of all-time highs, lows or extreme moves. For example, no VaR model predicted the Asian currency crisis of 1997 or the recent quasi-default of the Russian Government. VaR models cannot capture unexpected losses that arise as a result of exceptional, low probability events. The problem is that these types of events that are more likely to cause financial distress for financial institution than power outages, systems failure or processing errors.

Similarly, no VaR model can capture human intent. A common theme in reports on losses in financial institutions associated with "rogue traders" is that in none of the cases did the traders initially appear to intend to enrich themselves at the expense of the bank. While many traders circumvented poor internal controls, none appear to represent attempted embezzlement of funds. There is no sign in these reports that the traders involved engaged in true gambles - rather, they appear to have entered into trades that were, at the very least, fair bets with positive expected values. These individuals were largely driven by incentive systems that paid large bonuses based on trading profits, with little consideration of risks being taken in making these profits. We can conclude that the culture of these institutions, manifested in poor internal controls and poorly designed compensation systems, are as much to blame for the losses and failures as the individuals that executed the trades. Statistical models cannot capture the culture of organisations or the incentives of individuals within the organisations.

In this regard, some commentators consider the proposals in the Basel Consultative Document on operational risk to be less than effective because they focus on a loss-driven approach for quantification of risk rather than a performance-based approach (see King, 2001). Loss-driven approaches will not provide incentives for better operational risk management to the extent that they are not forward-looking. Loss-driven approaches primarily use historical data to measure performance effectiveness, and may reduce incentives to invest in improvements because outlays occur in current periods while paybacks will tend to be further in the future. There also appears no

mechanism in the proposals for validating the operational risk capital charge. The difficulty for financial institutions is to determine how incentives can be appropriately structured for risk managers who, in addition to measuring expected levels of risk, are meant to be looking for unexpected and extreme risks over a much longer time horizon. Research papers examining the use of extreme value theory (EVT) for modelling financial risk exposures are beginning to appear (see Embrechts (2000)). EVT is a statistical method that has found applications in engineering (safety and design of bridges, dykes, etc) and aerospace. Actuaries are also using EVT to model casualty insurance claims. We see research into the application of EVT to the quantification of low probability/high loss operational risk events as a major focus of risk management in the future.

INTEGRATED RISK MANAGEMENT

A theme gaining increasing attention in the risk management literature is "firm-wide risk management" or "enterprise-wide risk management". The fundamental premise of enterprise-wide risk management is that risk is managed holistically within the organisation: risk management is seen as an integrated process under which risk is measured and managed in terms of a common unit, and business lines are managed as a portfolio. Specifically, business lines are evaluated in terms of risk/return criteria, with the aim of optimising resource allocation: those lines generating the best returns per unit of risk (lower volatility of earnings) can expect to receive greater emphasis within the organisation. The more sophisticated approaches measure diversification benefits across business lines and thus aim for risk optimisation using a portfolio approach. We believe that the increasing focus on an enterprise-wide approach to risk management raises a number of research issues.

First, the portfolio approach implicitly assumes that the risk profile of individual business lines can be measured without regard to the risks taken by other business lines. This misses the reality that the actions of one business unit may impact on the underlying volatility of the revenue or earnings in another unit. This means that the total risk of the institution may, at times, be greater than the sum of risks of the business units, particularly in times of crisis or major market disruptions. While much focus in enterprise-wide risk management revolves around the degree of correlation between the risks faced by individual business units, it is necessary to incorporate into modelling estimates of the extent to which the actions of one business unit impact on the risks taken by another.

Second, most enterprise-wide risk management approaches assume that in order to produce a consolidated measurement of risk it is necessary to develop risk measures that are highly comparable across risk types. This is the central principle of risk-adjusted performance measures: risk is measured in terms of the single criterion of maximum possible loss within a given level of confidence. Cumming and Hurtle (2001) question whether consolidated risk management systems need to have a fully consolidated risk measurement methodology at their core. The essence of their argument is that comparability across risk measures may not be strictly necessary for an effective consolidated risk management system. If risk measures cannot be made perfectly compatible across risk types and business lines, it is necessary to consider the possibility that there may still be benefits to imperfectly comparable measures.

Third, our examination of the literature on enterprise-wide risk management indicates that the underlying concept of risk in these approaches is downside risk (the risk of unexpected losses).

Although risk optimisation is the principal objective of enterprise-wide risk management, there appears very little reference to 'strategic' risk management in these approaches. Strategic risk management can be thought of as managing risks to raise the probability of success. Specifically, taking too little risk can be considered as much a management failure as taking too much risk. Most risk-adjusted performance models do not incorporate upside risk in their assessment of performance. The focus on these models is what was achieved, rather than what could have been achieved. A truly integrated approach to risk management requires tools and techniques (supported by organisational structures, systems and processes) to enable individuals make intelligent risk-taking decisions before they commit limited capital and resources. Risk management is about the decisions that people take and the decisions they do not take. Downside risk management involves protecting the institution from losses through hedging techniques and compliance programs. Compliance programs, however, may generate high costs on organisations to the extent that they limit the ability of managers to pursue upside opportunities. This is likely to be intensified when penalties imposed on individuals are perceived to be more excessive than the potential rewards for gains that are achieved. A generally accepted problem with setting profit targets/budgets, for example, is that managers may act to avoid surpassing targets if they believe targets will be revised upward in future periods or if there appears no strong relationship between surpassing the target and the rewards for doing so. Also managers who consider that they are unlikely to achieve a target during the course of normal business operations may face an incentive to take on excessive risks in order to achieve target. Further, there may also be strong incentives to hide or misrepresent the risks that were taken in order to achieve target. Thus while risk management has traditionally focused on loss prevention and recovery for hard assets, there is a growing awareness that risk management must also incorporate the upside of business decisions. As organisations increasingly become knowledge based, risks associated with soft assets such as human resources and intangibles are becoming more important than hard assets such as property and equipment.

ECONOMIC VERSUS REGULATORY CAPITAL ALLOCATION

For some time banks have been using VaR approaches for calculating the economic (risk) capital in their products and business lines. The allocation of economic capital against these lines facilitates performance measurement and supports resource allocation by enabling banks to calculate the risk-adjusted return on economic capital in each of their activities. By comparing risk-adjusted returns to hurdle rates, banks have been able to determine which activities are value-enhancing and which are not, plus the size of their contribution to total economic value. A recent Lehman Brothers report finds that the insurance industry is behind banks in allocating capital on the basis of risk (Lehaman Brothers (2000)). The report finds that the industry is overcapitalised and does not make adequate returns on catastrophe-prone products. However, it notes that some insurance companies are implementing a risk-adjusted capital model to guide their pricing and business strategy.

The major issue facing banks is dealing with the "gap" between regulatory capital and economic capital. Internal bank models for calculating economic risk are telling banks that they need less risk capital than the minimum regulatory requirement. This is because internal models capture the unique risk profile of their banks and, in some cases, incorporate adjustments for diversification

gains across the product mix. Regulatory models are standardised and as such are less likely to capture the unique risk profile of individual institutions. The gap between regulatory capital and economic capital can be large in many institutions, and banks face the dilemma of having to return an acceptable return on regulatory capital while at the same time implementing effective pricing strategies that incorporate the economic risk in products. While this is the subject of ongoing research, the emerging trend for financial institutions is to price products on the basis of regulatory capital (this does represent the capital base of the bank) but evaluate performance of individual products on the basis of return on economic risk capital. While this approach would appear logical, it nonetheless presents problems. Pricing on the basis of regulatory capital may render some products uncompetitive if the regulatory capital allocation substantially exceeds the economic capital allocation. This would particularly be the case for products provided by competitors that do not face the same regulatory requirements (for example, independent mortgage providers). Further, is measuring performance on the basis of economic equity economically sound? While this approach aims to capture the "true" risks in products, it nonetheless presents a dilemma when a product that has low economic risk also has a relatively high regulatory capital charge. While such a product may utilise less economic capital, economic capital is purely conceptual; that is, a tool for management. Other business segments may argue that if this product absorbs a high proportion of actual (regulatory) capital, then this should be incorporated in assessing its performance relative to other products.

CONCLUSION

The three major risk management issues identified in this study have at their core the appropriate level of capital that a financial institution should hold. Regulators and institutions are spending considerable resources determining an appropriate capital charge for operational risk, but paradoxically, the low probability/high loss events that have recently wiped out some institutions remain largely unaccounted for in capital charge determinations. Integrated risk management has at its core a portfolio approach to risk that implies lower capital charges may apply when risk is measured and manage from an enterprise-wide perspective. We find the portfolio approach may not be appropriate when institutions are exposed to extreme events. Finally we find that regulatory capital charges may differ considerably from economic risk measures, and as such, distort capital allocation within a financial institution to the extent that the riskiest activities may be undercapitalised.

SELECTED REFERENCES

Bank for International Settlements (2001a), 'Consultative Document: Operational Risk', Basle Committee of Banking Supervision.

Bank for International Settlements (2001b), 'The New Basel Capital Accord', Basel Committee of Banking Supervision.

Beder, T., (1999), 'The Great Risk Hunt', *Journal of Portfolio Management,* May, 28-34.

Cumming, C. & Hirtle, B., (2001), 'The Challenges of Risk Management in Diversified Financial Companies'*, Economic Policy Review*, Federal Reserve Bank of New York.

Demsetz, R, Saidenberg, M. & P. Strahan, (1997), 'Agency Problems and Risk Taking at Banks', *Federal Reserve Bank of New York.*

Embrechts, P. (2000), 'Extreme Value Theory as a Risk Management Tool', *North American Actuarial Journal*, (3), 2, 30-41.

Houston, J. & C. James (1995), 'CEO Compensation and Bank Risk: Is Competition being Structured to Promote Risk Taking?' *Journal of Monetary Economics*, 36, 405-431.

King, J., (2001) *Operational Risk,* Wiley Finance, London.

Lehman Brothers (2000), 'Risk-Adjusted Capital: An Emerging Positive Secular Trend', *Research Report*, September 6, 2000.

Mumma, D. (1998), 'Risk Management Outsourcing'*, Commodities Now*, June.

Puschaver, L. & R. Eccles, (2000), 'In Pursuit of the Upside: The New Opportunity in Risk Management' *PricewaterhouseCoopers.*

Santomero, A. & D. Babbel, (1997), 'Financial Risk Management by Insurers: An Analysis of the Process', *Journal of Risk and Insurance*, 64, 2, 231-270.

Tscheogl, A. (1999), 'The Key to Risk Management: Management', *Working Paper*, Wharton Financial Institutions Centre.

BALANCED SCORECARD IN A SOCIAL HEALTH CARE INSTITUTION

Zofia Huber Swinarski, HEC, University of Geneva
Natacha Martinot, HEC, University of Geneva
Bernard Morard, HEC, University of Geneva

ABSTRACT

The public policy of health aims to rationalize the supply of services for the social health care institutions. This rationalization means that several standards of performance have to be set for each institution. To supervise or control whether or not each institution applies a standard, it has to define its real level of performance. The notion of performance applies to defined categories based on the required services that are standardized and necessary (for example, the time required for nursing) and for biologic, psychological and social criteria of classification. Naturally, reality differ from standard services, which are base for the invoicing system and thus the financing of the institution.

In a first part, we will present a concept based on the "Dashboard" approach for measuring performance. Then we will present the concept of the "Balanced Scorecard" adapted to the social sector and link this concept to an ABC cost function. In the second part, we will focus on a large social health care institution (106 beds) that is state-subsidized and administered by a private foundation. We will illustrate how to consider real performance and then integrate our findings into a "dashboard".

INTRODUCTION

The notion of organizational performance subject to competition dominates much of current management debate. The debate has spread to cover competition and performance in the public sector, and in particular the public health industry. Until recently, the social health care centres were financed on the basis of fixed package rates intended to ensure a fair financing of the institution. The rationalization of public finances has had a significant impact on this and has led the way to the introduction of standardized services and diagnosis-related-group-type payments. Thus, the health care organizations suddenly started to be ruled by an economical consideration raising at the same time the question of performance. Thus, this traditional management vocabulary appears in the public sector for the first time. However, the health sector presents two specificities, these being : strong asymmetry of information, inelasticity of the supply and scarcity of resources by way of a rigid pricing policy. Concerning the first point, the patient lacks information about the conditions of admission, about the care-services he will receive when he applies for a room in a social health care center. The inelasticity of the supply can be explained as following : the social health care organizations do not have to attract patients as their occupation rate is close to 100% and each organization has queuing lists. This situation shows a growing demand and a non-elastic supply. The

question of resources' scarcity can be analyzed on two levels : financial and technical. On the technical level, the social health care centers have to respect specific guidelines concerning their services and their quality. From the financial point of view, all the prices are fixed by political authorities, the institution has therefore no freedom of negotiation in pricing and budgeting.

The previous elements encourage to re-think the notion of performance in a constrained environment where neither the price nor the services can be managed independently. Thus the performance cannot be limited to financial elements alone, rather it should reflect sector related specificities. This leads us to consider the idea of integrating "dashboard" techniques to monitor and measure the different dimensions of the analysis. Of the different "dashboard" techniques available, we chose to use the "Balanced Scorecard" approach along with "Activity Based Costing (ABC)" approximation of cost functions. However, this brought us to question the relevance of the link between corporate strategy and the indicators used to represent the strategy.

In our analysis, we will concentrate on the problematic of building and setting up of a Balanced Scorecard in a social health care institution aiming to manage its performance based on newly imposed economical considerations. In the first part of this paper we will analyze the existing literature concerning the health care sector. Here, we will illustrate the ambiguity of the Balanced Scorecard concept and will propose an analytical approach based on the cost function suggested on the Activity Based Costing method. In the second part, we will tackle the setting up of the model through an experience at large Swiss social health care institution (EMS). Here we propose a Balanced Scorecard presenting an underlying economical rationale that should characterize an effective use of a Dashboard.

THE CONCEPT OF BALANCED SCORECARD

In recent years the notion of "performance" dominated the vocabulary used in management. New concepts such as Activity Based Costing and Management, Value Chain, TQM, Management by Objectives, Balanced Scorecard became common language of every up-to-date manager. The starting point of the Balanced Scorecard was Kaplan et Norton's reaction to the traditional financial accounting model which doesn't take into account such assets and information as employee skills, customer loyalty, turnover and other ratios and data. They concluded that by concentrating on financial measures only, a short-term performance is promoted instead of a long-term value creation (Kaplan, 2001). This statement pushed them to develop a new method that assembles the financial and non-financial indicators which give a clear picture of what is the "real" value of a company. The Balanced Scorecard was born.

The Balanced Scorecard considers company's performance from four angles: financial, customer, internal and learning/growth. These four perspectives are set in order to inform all company's stakeholders: customers, shareholders, employees, public authorities. Each perspective is expressed by a set of objectives and measures. "The measures represent a balance between external measures for shareholders and customers, and internal measures of critical business processes, innovation and learning and growth. The measures are balanced between the outcome measures - the results from past efforts - and the measures that drive future performance" (Kaplan and Norton, 1996).

Originally this multidimensional approach of measuring performance was created in 1992 for the for-profit sector. However, few years later, the same concept has been adapted to non-profit organizations. In the article that followed an international workshop on "The Role of Accounting in Public Sector Transition" Dana A. Forgione (Forgione D.A., 1997) introduces the idea of using the BSC in the health care sector. She argues that new management tools such as capitated payment systems or diagnosis-related group-type price controls place strong financial incentives in opposition to health care quality. While admitting the importance of the efficient allocation of capital resources, Forgione claims that quality disclosures are crucial for the efficient allocation of health care resources. The Balanced Scorecard combines this double requirement for profitability and quality of care.

BALANCED SCORECARD APPLIED TO HEALTHCARE PROVIDERS

"It's always been difficult to find a language that both administrators and clinicians can understand. The Balanced Scorecard bridges that language barrier.." (Meliones J.M., 2000). This quote of Jon Meliones, who introduced the Balanced Scorecard at Duke Children's Hospital, pinpoints the importance of the Balanced Scorecard in the health care environment. In fact, the Balanced Scorecard gives a more complete picture of health care activities than the financial statement alone and thus becomes a privileged tool for a deeper dialogue between professionals and health care management.

Besides this communication aspect, the Balanced Scorecard helps to set priorities between organization's objectives. When analysing his organization, Meliones noticed that its financial health is the condition for quality improvements: "I realized that Duke Children's Hospital" needed to start thinking less like a money-losing non-profit and more like a profitable corporation. (…) If the hospital didn't show a margin, clinicians wouldn't be able to fulfil their mission". Agreeing with these statements means placing the financial perspective at the very bottom of the perspectives' hierarchy, as being the condition of the fulfilment of the other three perspectives. The original architecture of the Balanced Scorecard, designed for the for-profit organizations, placed the financial perspective at the top of the hierarchy. If the other three perspectives were developed in the right direction, the financial results should follow. The non-profit organizations however, often place the customer perspective at the top. This choice will depend on what the long-term objective of the organization is (Kaplan, 2001).

In health care organizations, the cause-and-effect relationships between the perspectives is much less clear as it is in the for-profit organizations. As the patient doesn't pay the price relative to the cost that he generates and the organization's main revenues are provided by subsidies, the financial aspect looses its importance. Nevertheless, in reaction to the diminution of resources, the health care organizations' survival depends more and more on their accurate allocation and thus the financial perspective becomes a constraint not be ignored and a base for the fulfilment of the other three perspectives. In the Swedish experience, the four perspectives are not viewed as a hierarchy but as a network of perspectives in balance. "Balance was seen as a strategy to maximise patient utility not as the means to achieve financial success" (Aidemark, 2001). However, the Swedish

system is known for being a very socially oriented system and thus a budget deficit would be covered by an additional subsidy. That is not the case in most other countries.

Several successful attempts of the Balanced Scorecard include the experience at Duke Children's Hospital (Meliones J., 2000) and the introduction of balanced scorecards in Swedish hospitals (Aidemark, 2001). However, the first well documented application of the Balanced Scorecard concept for a healthcare provider is the cited in report on the relative performance of 89 acute-care non-for-profit hospitals in the Canadian province of Ontario. The four Balanced scorecard perspectives have been adapted for use in a publicly funded health service setting as follows: Financial Performance and Condition, Patient Satisfaction, System Integration and Change and Clinical Utilization and Outcomes. For each perspective a set of performance indicators have been proposed and agreed on jointly by the research team and each perspective's stakeholders (for example: physicians, nurses and other clinicians for the perspective "Clinical Utilization and Outcomes") (Pink G.H., McKillop I & ss, 2001).

BALANCED SCORECARD'S ECONOMIC FOUNDATIONS

To conclude this brief description of the Balanced Scorecard we asked ourselves the question what is the causality logic between the variables of the Balanced Scorecard. After having examined the literature about Balanced Scorecard we found no information about the method used to choose the proxies for each of the four perspectives. Not satisfied with the answer that the BSC is a consensus-driven methodology and that the variables derive naturally from organization's strategy, we set out on a quest to find out what implicit economic foundations lie beneath the choice of the Balanced Scorecard variables.

Balanced Scorecard is broadly understood as a translation of the organization's strategy into operational objectives. In every organization - profit or non-for-profit - the strategy is to create value. Each decision or lack of decision has a financial consequence, for example: the level of dissatisfaction of a patient (a BSC variable) can lead to a conflict with nurses and their dissatisfaction resulting in a) absenteeism, b) trial against the hospital for mobbing, c) nurse quitting her job which requires hiring and training a new nurse. Each one of the listed consequences leads to a cost. Thus, we notice that there is implicit connection between the Balanced Scorecard variables and the components of the cost function.

Following the methodological approach described in the ABC method, we considered a series of variables to test whether or not they play a significant role in determining total cost. We define the organization's cost function as a function of volume-based, complexity and efficiency variables. It is logical to admit that these variables possibly influence the cost level and consequently we suppose here that Balanced Scorecard must translate their impact. As the translation of these variables into a Scorecard isn't obvious, we have to go through proxies. There can be more than one proxy for each variable. Therefore we will look for proxies for each of the four perspectives and find out which variables are the most significant cost drivers in modelling organization's cost.

If we adopt the proposed methodology, we shall formulate the cost function by connecting the total cost of the establishment and services realized for the patient. Let us call:

x_t : quantity of services realized at the time t, with t=1 .T,

c_t : total charge observed in t with t=1 .T,

ε_t : residual term,

a, b: unknown term translating an average variable cost and the term of fixed cost.

Thus, we obtain the relation:

(Equation 1)　　　　　　$c_t = a x_t + b + \varepsilon_t$.

In the next step we shall select the variables allowing to complete the explanation of the cost function with the help of the stepwise procedure . These variables concern not only the number of patients, the unit cost for each category of patient, but also the staff and the organization. In this perspective we use the standard cost to approximate the "real" cost. Following this we call :

a_i^*, a_i : standard cost and real cost for each category i,

a_i^+, a_i^- : upper and lover level of the standard cost I ,

c_t^+, c_t^- : upper and lover level of the total cost for each period t.

(Equation 2)

$$Min \sum_{i=1}^{n} (a_i - a_i^*)_2,$$

$$Sc : \quad \sum_{i=1}^{n} a_i x_{it} \leq c_t^+, \quad \sum_{i=1}^{n} a_i x_{it} \geq c_t^-, \quad a_i^- \leq a_i \leq a_i^+.$$

APPLICATION: ANALYTICAL DESCRIPTION OF THE EMS LB

The EMS LB (in French: EMS: Etablissement Médico-Social) is a private establishment for elderly people, located in Switzerland. This establishment is intended for people who need regular medical care and who can not live alone. It has a capacity of 106 beds, composed of 31 double rooms and 44 single rooms. Patients can enter this institution for a day, a short or a long stay.

This organization has first asked us to calculate the cost of their "products". We broadened this objective by proposing to elaborate together a Balanced Scorecard built on their actual priorities. In this type of organization we consider as "products" patients' categories composed of eight classes. In order to understand this classification, we present in the next section the method on which this categorization is based.

CLASSIFICATION PLAISIR

From 1990 on, Switzerland was subject to an economic crisis. The public health authorities were forced to reduce theirs budgets. That's why they decided to redefine the resources allocated for elderly people's institutions (EMS). In 1995, in order to solve this problem, nursing personnel together with management and the insurance companies chose an evaluation and classification method, previously used in Quebec, called PLAISIR. Subsequently, this system has been adapted and modified for Switzerland.

PLAISIR (Computerised Planning of Required Nursing Care) is a clinical-administrative information system that allows to follow the evolution of the patient's state, the services he requires and his needs for nursing care and assistance. The EMS accommodate more or less dependent patients, the majority of whom is over 65 (PLAISIR, 93).

The classification PLAISIR with a nomenclature of care (standard care and standard time nursing) calculate the quantity of nursing and assistance resources of the patient. Thus this system provides some information for elderly people : their bio-psycho-socio profile (problems, handicaps, disease and deficiency), the number of services (nursing care and assistance) and the amount of time resources (time required for nursing). These standards of care and assistance have to correspond to what is recognized as a "good practice" in the Swiss establishments. If they do not correspond to optimal care, they should guarantee the patient a well-being and a suitable security. Thus, thanks to the PLAISIR method each patient's category, needed nursing time, age and length of stay can be easily defined.

BUILDING THE BALANCED SCORECARD

For the time being, the information system at EMS LB is very limited. All the indicators that have been given to us, have been gathered manually. As the state doesn't require any clinical statistics, no proxies for the perspective "Clinical Utilization and Outcomes" are available. As for the perspective "Patient Satisfaction", a new law just introduced the requirement for patient-satisfaction surveys - first such inquiry will be done later this year. Therefore, we couldn't use the Ontario model as such. The information that is available is the following (per quarter during three years, between January 1999 and December 2001): profit & loss statement, balance sheet, number of patients in each class, number of disabled patients in each class, number of new admissions, number of different types of employees (nurses, animators, hotel staff, technical staff, administration staff).

We admit that this information is subject to a regular control (from financial and technical point of view) and thus that the variables are observed without error. In order to build the Balanced Scorecard, we proceeded as described in paragraph "Balanced Scorecard's economic foundations". Thus, we are looking for proxies for each of the four perspectives of the Balanced Scorecard. Our initial cost equation is a function of following, available variables: Occupation rate, Total salaries / total charges, Medical fees / total charges, Number of patients (variance), Nursing personal /total staff, Animation personal /total staff.

Through the stepwise regression of the cost function (equation 1) we obtain four significant variables. These four variables illustrate as many perspectives as can be defined in a Balanced Scorecard: Financial perspective (Total salaries / total charges), Patient perspective (Number of patients), Processes perspective (Occupation rate), Employees perspective (Nursing personal /total staff). These four variables can be illustrated by proxies derived from the organization's strategy (see Table 1). By hypothesis, the variables should be strongly correlated with the proxies.

The organization's strategy is to maximize the patient's comfort and well-being. Nevertheless, as there is a financial constraint and several patients to be satisfied, we could express the organization's strategy as optimising its expenses in order to satisfy the maximum of patients or,

in different words, to supply all the patients with a basket of services, keeping to financial constraints linked to the pricing system and to the legal structure of the organization. The success factors formulated on four perspectives are : Financial: keep budgets, effective use of resources, Patient: satisfaction, availability, information, reception, security, Processes: effective chains of care and Employees: training, work satisfaction.

Translating these success factors into variables that are accessible in the organization leads on the following scorecard:

Table 1 Balanced Scorecard at EMS LB			
Financial	Patient	Processes	Employees
Average cost per patient category and per day (*)	Average Length of Stay	Nursing time per patient category	Absenteeism rate
Added value per patient	Mortality rate	Application of "PLAISIR" guidelines	Staff turnover
Added value per employee	Dissatisfaction rate (food, hotel services, nursing, medical, leisure)		Training (training cost / total cost)
	Infirmity rate (number of infirm patient / total patients)		
	Prevalence of social activities (activity leaders' salaries / total salaries)		
	Prevalence of nursing (nursing personnel salaries / total salaries)		

The variables that appear in this Balanced Scorecard have been chosen to represent the cost function and to capture the organization's strategy after discussion with the EMS LB manager, the head of nursing staff, the head of Human Resources and the chief-accountant. Only few of these variables are available. The others will be set up progressively in the near future.

Financial

The variable "Average cost per patient category and per day" can be calculated using the equation (2). We obtain the average unit cost for each of the eight patient categories. For the next year, these results will be used as standard costs and thus will allow useful comparisons. It is obvious that the EMS has to calculate the unit costs per patient category every quarter.

The variable "Added value per patient" can be calculated by dividing the net operating margin by the number of patients.

The variable "Added value per employee" can be calculated by dividing the net operating margin by the number of employees.

Patient

The variable "Average Length of Stay" is available but non systematically calculated

The variable "Mortality rate" is available but non systematically calculated

The variable "Dissatisfaction rate" (food, hotel services, nursing, medical, leisure) will be available at the end of 2002 after the patient satisfaction survey conducted in the first half of 2002

The variable "Infirmity rate" (number of infirm patient / total patients) is not yet available. The institution has to define what they consider to be infirmity

The variable "Prevalence of social activities" (activity leaders' salaries / total salaries) is available

The variable "Prevalence of nursing" (nursing personnel salaries / total salaries) is available

Processes

As for the variable "Nursing time per patient category", we have the standard values (calculated by the PLAISIR method). The knowledge of the real values would require setting up of an information system. Therefore, this variable will not be available before three-five years

The Application of "PLAISIR" guidelines is compulsory. The standard variable corresponds to the guidelines. The real variable is unknown.

Employees

The variable "Absenteeism rate" is known but non used in any printed reporting

The variable "Staff turnover" is known but non used in any printed reporting

The variable "Training" (training cost / total cost) is known but non used in any printed reporting.

Once all the proxies are available in the organization through a newly set-up information system, the correlations between the proxies and the four variables (see Table 3) will be tested. Only then a Balanced Scorecard adapted to the reality of the EMS LB will be defined. Obviously, this Balanced Scorecard should be updated each quarter.

CONCLUSION

In conclusion : The Balanced Scorecard has necessarily to follow the economical logic of the organization in its environment, and The construction of the Balanced Scorecard has to depend on the generalized cost function.

The first conclusion gives us an analytical basis for the construction of a Balanced Scorecard if we admit that every strategy aims to create added value for the organization. The second conclusion is derived from the conception of the cost function in the ABC-type approaches which have to integrate number of services, complexity and the nature of the organization.

At this stage two issues remain: the choice of the proxies to translate the cost function's variables and the optimization of the processes. Regarding the first point, an obvious link has to appear between variables and proxies chosen to translate the variables. However nothing allows to suppose that this choice is definitive, because, as the function is re-evaluated on a regular basis with new indicators, the structure of the Scorecard can change. Regarding the optimization of the processes, the key-variable generating income remain the patients classified by category. Therefore, to get optimum financial result, occupation rate and number of personnel, it is fundamental to optimize the number of patients per category. We have here our next step of the analysis.

REFERENCES

PLAISIR 93, guide des extrants, EROS, Montréal, October 94

Aidemark L-G, *The meaning of Balanced Scorecards in the Health Care Organization*, Financial Accountability & Management, 17 (1), February 2001, 23-40

Commision technique intercantonal PLAISIR, *Rapport annuel*, ISE, http://www.hospvd.ch/public/ise

Dahlgren J., Holmström M., Nehler H., *Activity Based Costing diffusion and adoption*, congress EAA, Athens 2001

EROS, « PLAISIR », http://www.erosinfo.com/plaisir/

Forgione D.A., *Health Care Financial and Quality Measures: International Call for a "Balanced Scorecard" Approach*, Journal of Health Care Finance 1997, 24 (1), 55-58

Hospital Report 2001: Complex Continuing Care Report 2001

Kaplan R.S., Norton D.P., *The Balanced Scorecard: translating strategy into action*, Harvard Business School Press, 1996

Kaplan R.S., Norton D.P., *Transforming the Balanced Scorecard from Performance Measurement to Strategic Management*, Accounting Horizons, 15 (2), June 2001, pp 147-160

Kaplan R.S., *Strategic Performance Measurement and Management in Nonprofit Organizations*, Non-profit Management & Leadership, 11(3), Spring 2001

Meliones J.N., *Saving Money, Saving Lives*, Harvard Business Review, November-December 2000, Vol. 78 (6), 57-65

Pink G.H., McKillop I., Schraa E.G., Preyra C., Montgomery C., Baker G.R., *Creating a Balanced Scorecard for a Hospital System*, Journal of Health Care Finance 2001, 27 (3), 1-20

Porter M., *Competitive advantage*, Free Press, New York, 1985

Van Veen-Dirks P.M.G., Wijn M.F.C.M, *Critical Success Factors and the Balanced Scorecard, a matter of complementarity*, Congress EAA, Athens 2001

Weber D.O., *A Better Gauge of Corporate Performance*, Health Forum Journal, May/June 2001

Wegmann G, *Les tableaux de bord stratégiques: une instrumentation du contrôle de gestion stratégique, concepts, instrumentation et enquête*, Congress AFC, Metz 2001.

AN ANALYSIS OF ALTERNATIVE PROFIT EFFICIENCY SCORES AND FINANCIAL RATIOS: DOES BANK SIZE MATTER?

Stephen K. Lacewell, Murray State University
Larry R. White, Mississippi State University
Kevin E. Rogers, Mississippi State University

ABSTRACT

The subject of bank performance has been and still is a subject of much debate among researchers in the financial institutions area. Although there is probably no one universally accepted measure of performance, the area of performance measurement can be divided into two rather large streams of research: bank efficiency measures and accounting-based financial ratios. This paper merges the topics of bank efficiency and accounting-based financial ratio performance. It examines the relationship between these seemingly separate areas to determine when and if they should be used in combination. The study involves a multi-stage process. Stage one is the calculation of alternative profit efficiency scores, using the stochastic frontier approach, for all banks operating in the United States during the years 1996 and 1999. Stage two involves gathering and/or calculating financial ratios that are, according to previous research, highly correlated with each of the CAMELS rating components used by financial regulators. Stage three involves the use of multiple regression to determine 1) if a relationship exists between the chosen financial ratios, which serve as a proxy for the publicly unavailable CAMELS ratings, and the alternative profit efficiency scores and 2) the strength and direction of the aforementioned possible relationship. The findings indicate that, as widely hypothesized, large and small banks are fundamentally not the same in terms of input and output mix, which is consistent with previous studies. Thus, as evidenced by the inconsistency of the relationships between financial ratios and profit efficiency estimates by asset size, if an efficiency indicator is to be used as an addition to the CAMELS rating, one should be chosen that takes these differences into account so as not to penalize either large or small institutions.

INTRODUCTION

The subject of bank performance is a subject of much debate among researchers in the financial institutions area. Although there is probably no one correct measure of performance, the area of performance measurement can be divided into two rather large streams of research: bank efficiency measures and accounting-based financial ratios. This paper merges the topics of bank efficiency and accounting-based financial ratio performance and examines the relationship between these seemingly separate areas to determine when and if they should be used in combination.

This study involves a multi-stage process. Stage one is the calculation of alternative profit efficiency scores, using the stochastic frontier approach (SFA), for all banks operating in the United States during the years 1996 and 1999. This model is termed the national model per Mester (1997) due to the fact that all banks, for which sufficient data are available, are used to estimate the efficient alternative profit frontier. Stage two involves gathering and/or calculating financial ratios that are, according to previous research, highly correlated with each of the CAMELS rating components used by financial regulators. Stage three involves the use of multiple regression to determine 1) if a relationship exists between the chosen financial ratios, which serve as a proxy for the publicly unavailable CAMELS ratings, and the alternative profit efficiency scores and 2) the strength and direction of the aforementioned possible relationship.

It is hypothesized that accounting-based financial ratios utilized by various financial institution examination agencies in the formulation of CAMELS ratings provide significant information regarding the efficiency measure of a bank. It is further hypothesized that different types of relationships will exist among banks of varying asset size. If different relationships do exist, this will shed new light on the issue proposed by many researchers regarding the use of efficiency measures as complements to CAMELS ratings in the financial institution examination process. The results of this paper will be of interest to many parties due to the fact that determining a correct measure of bank performance must take into account the high degree of competitiveness, technological change, customer-base diversity, and other areas of the firm's operating environment found in the U.S. banking industry.

LITERATURE REVIEW

While the area of production frontiers was introduced by Farrell (1957), the stochastic frontier, also called the composed error, is relatively new having been introduced by Aigner, Lovell and Schmidt (1977) and Meeusen and van den Broeck (1977). Many of the first papers on this topic were applied to manufacturing data, as were other efficiency methods. Much study has taken place regarding the early problems associated with this method. Stochastic frontier analysis (SFA) is today, however, one of the most popular efficiency estimation techniques due in part to its robustness and relative ease of use.

Among the first to examine the relationship between financial performance, measured by accounting-based ratios, and production performance proxied by efficiency indices, are Elyasiani, Mehdian, and Rezvanian (1994). They find a significant association between financial ratios and bank efficiency and suggest that efficiency analysis should be considered as a supplement to financial ratio analysis by regulatory agencies and bank managers. The article focuses, however, on large banks and utilizes a rather small sample. Thus, the true nature of the relationship is not explored across a wide variety of banks operating in the U.S. One study which provides a very brief although interesting attempt to integrate the information provided by efficiency measures with that found in CAMELS ratings is by Simeone and Li (1997). They determine that SFA can be considered a good substitute for, or a valid supplement to, the CAMELS rating due to the fact that SFA avoids the subjective and difficult management rating utilized by CAMELS.

Studies regarding productive efficiency by bank size include Evanoff (1998) and Elyasiani and Mehdian (1995). They find that under the hypothesis of identical frontiers for large and small banks that the efficiency measures for each are similar in 1979 but separate in favor of large banks in 1986. This finding is consistent with Shaffer (1989) but inconsistent with Rhodes and Savage (1981) and Zimmerman (1990). It is also found that large and small banks possess separate and dissimilar best practice frontiers. Thus, the efficiency patterns of the two groups may be said to be correlated with distinct characteristics of the markets and environments in which the two groups operate. Rogers (1998) assess the viability of small banks by examining their X-efficiency relative to larger institutions. Results suggest that after adjusting the frontier for size, small banks are found to be less profit efficient than larger institutions but more cost efficient. It is posited that this will allow small banks to compete with large banks in terms of costs but may hamper their profitability as industry consolidation continues. Other studies of interest include DeYoung, Hasan and Kirchhoff (1997), Park and Simar (1995) and Park, Sickles and Simar (1998).

DATA AND METHODOLOGY

The data used in this study are obtained from the Sheshunoff BankSearch Commercial and Savings Banks database for the years 1996 and 1999, respectively. A sample of all banks for which there is available data is obtained for the two years with 7,514 banks for 1999 and 8,179 banks for 1996. The sample is then decomposed, by asset size, into sub-samples representing banks that fit into small, medium, and large categories. The definition of a small bank, for purposes of this study, is a bank with less than $100 million in total assets. A medium bank is an institution with $100 million to $1 billion in assets and large bank is one with greater than $1 billion in total assets. The size categories include 319 large, 2,577 medium, and 4,618 small banks in 1999 and 338 large, 2,533 medium, and 5,308 small banks in 1996.

A relatively new model concerning the measurement of profit efficiency is used in this study. The alternative, or nonstandard, profit efficiency model, as given by Berger and Mester (1997) and Humphrey and Pulley (1997), differs from the standard profit efficiency model in that it measures how efficient a bank is at earning its maximum available profit given its output levels.

The alternative profit efficiency score for any bank can be calculated once the alternative profit frontier has been constructed. The alternative profit efficiency of bank is calculated as the predicted actual observed profit of bank divided by the predicted maximum profit of the best practice bank, i.e., the predicted maximum profit across all banks, adjusted for random error. The calculated raw profit efficiency scores are then truncated at the top 5 and 10 percent levels, per Berger (1993), so as to eliminate any distortion which may be caused by outliers when the maximum profit is used. The truncated profit efficiency scores can range from 0 to 1 with 1 representing the most efficient bank or the best practice bank. The profit efficiency score represents the percentage of profits or resources that are used efficiently. Thus, a bank that receives a profit efficiency score of 0.75 is 75% efficient or consequently loses 25% of its potential profits relative to the best practice bank facing similar operating conditions.

After the efficiency estimates have been calculated the next step of the analysis involves the selection of variables which theoretically correlate to each of the CAMELS rating categories used

by examiners. The efficiency estimates obtained in stage one are then regressed on the group of financial variables obtained in stage two to determine the direction and strength of the association and to allow for comparisons of such relationships considering bank size. A control variable representing a bank's regulatory affiliation is also included in the regression.

Due to the non-availability of data needed to calculate all of the financial ratios chosen for the analysis, the sample size of banks included in stage two of the study is reduced. The final sample consists of 4,376 banks in 1999 and 5,158 banks in 1996. The sample by size category includes 282 large, 1,916 medium, and 2,178 small banks for 1999 and 318 large, 2,003 medium, and 2,837 small banks for 1996.

EMPIRICAL RESULTS

The results of the efficiency estimation as well as the association regressions prove interesting. Large banks are shown to be less profit efficient than medium banks and medium banks less efficient than small banks in both 1999 and 1996. Additionally, the results of the deterministic regressions as a whole seem to support a priori expectations and are mostly consistent with Elyasiani et al. (1994), with the exception being the operating income variable. The output shows that many of the relationships that exist using the results of the national model and financial ratios in the all banks category disappear when the banks are segmented by asset size. Additionally, these differences indicate that large and small banks are fundamentally not the same in terms of input and output mix, which is consistent with previous studies. Thus, as evidenced by the inconsistency of the relationships between financial ratios and profit efficiency estimates by asset size, if an efficiency indicator is to be used as an addition to the CAMELS rating, one should be chosen that takes these differences into account so as not to penalize either large or small institutions.

CONCLUSIONS

As shown in the previous section, the relationship between financial ratios and profit efficiency estimates is indeed different for banks of varying size. The relationship also differs when analyzing all banks together versus segmenting them by asset size. It is found that large banks achieve, on average, a better fit between financial ratios and profit efficiency scores. This supports the hypothesis that an efficiency measure added to the financial ratio analysis currently used by regulators would be more beneficial to large banks than small banks, thus penalizing smaller institutions. Furthermore, the findings indicate that, as widely hypothesized, large and small banks are fundamentally not the same in terms of input and output mix, which is consistent with previous studies. Thus, as evidenced by the inconsistency of the relationships between financial ratios and profit efficiency estimates by asset size, if an efficiency indicator is to be used as an addition to the CAMELS rating, one should be chosen that takes these differences into account so as not to penalize either large or small institutions.

REFERENCES

Aigner, D.J., C.A.K. Lovell and P. Schmidt, "Formulation and estimation of stochastic frontier production function models," *Journal of Econometrics*, 6, 1977, 21-37.

Berger, Allen N., "Distribution-free estimates of efficiency in the U.S. banking industry and tests of the standard distributional assumptions," *Journal of Productivity Analysis*, 4, 1993, 261-292.

Berger, Allen N. and Loretta J. Mester, "Inside the black box: What explains differences in the efficiencies of financial institutions?" *Journal of Banking and Finance*, 21, 1997, 895-947.

DeYoung, Robert, Ifekhar Hasan and Bruce Kirchhoff, "Out-of-state entry and the cost efficiency of local commercial banks," Office of the Comptroller of the Currency, E&PA Working Paper, 97-7, April 1997.

Elyasiani, Elyas, Seyed Mehdian and R. Rezvanian, "An empirical test of the association between production and financial performance: The case of the commercial banking industry," *Applied Financial Economics,* 4, 1994, 55-59.

Evanoff, Douglas D. "Assessing the impact of regulation on bank cost efficiency," Federal Reserve Bank of Chicago Economic Perspectives, Second Quarter 1998, 21-32.

Farrell, M.J., "The measurement of productive efficiency," *Journal of the Royal Statistical Society*, 120, 1957, 253-281.

Humphrey, D.B. and L.B. Pulley, "Banks' response to deregulation: Profits, technology, and efficiency," *Journal of Money, Credit, and Banking*, 29, 1997, 73-93.

Meeusen, W. and J. van den Broeck, "Efficiency estimation from Cobb-Douglas production functions with composed error," *Internation Economic Review*, 18, 1977, 435-444.

Mester, Loretta J., "Measuring efficiency at U.S. banks: Accounting for heterogeneity is important," *European Journal of Operational Research*, 98, 1997, 230-242.

Park, B.U. and L. Simar, "Efficient semiparametric estimation on stochastic frontier models," *Journal of the American Statistical Association*, 89, 1995, 929-936.

Park, B.U., R.C. Sickles and L. Simar, "Stochastic frontiers: A semiparametric approach," *Journal of Econometrics*, 84, 1998, 273-301.

Rhoades, S.A. and D. Savage, "Can small banks compete?" *Bankers Magazine*, January/February, 1981, 59-65.

Rogers, Kevin E., "Product mix, bank powers, and complementaries at U.S. commercial banks," *Journal of Economics and Business*, 50. 1998, 205-218.

Rogers, Kevin E., "Consolidation is the U.S. Banking industry and the viability of small commercial banks: X-efficiency and bank size," Working Paper, Mississippi State University, 1998b.

Shaffer, S., "Challenges to small bank survival," Federal Reserve Bank of Philadelphia *Business Review*, September/October 1989, 15-27.

Simeone, William J. and H.C. Li, "Credit union performance: An evaluation of Rhode Island institutions," *American Business Review*, 15, 1997, 99-105.

Zimmerman, G.C., "Small California banks hold their own," Federal Reserve Bank of San Francisco *Weekly Letter*, 26, January 1990.

MARKET FRICTION, COMPETITION AND AUSTRALIAN VARIABLE MORTGAGE RATES

Helen Lange, Macquarie University, Sydney, Australia

ABSTRACT

This paper examines the nature and extent of price inertia in the Australian variable rate mortgage market, through an examination of the size, frequency and duration of variable mortgage rate changes, and the analysis of elasticities. This represents the first study of price stickiness of variable mortgage rates, and the first of its type using Australian data. Unlike the US style adjustable rate mortgages, Australian banks issuing variable rate mortgages have full discretion to change rates at any time and by any amount. If markets are frictionless, then we would observe continuous pricing. However, the analysis in this paper finds that this is not the case for Australian bank variable rate mortgages, and that there is evidence of price stickiness. Further, the results show that there appear to be differences in market friction in bank variable rate mortgages relative to that of bank competitors.

INTRODUCTION

The discussion of market friction concerns itself with one aspect of the examination of a situation in which a bank uses whatever control it has over the interest rate to increase profits (see [19]). Finance theory assumes prices adjust continuously, leading to market clearance through efficient resource allocation. Sticky prices do not fit this model, and consequently, debate over whether market friction creates inefficient resource allocation has ensued. There is, however, agreement that rational firms may not adjust prices quickly if other factors impact, such as price adjustment costs (Barro, 1972; Mankiw, 1985; Stiglitz, 1985).

There have been a number of empirical studies of links between price friction and industry type (Carlson, 1990; Simon, 1969; Primeaux & Bombull, 1974) and market concentration/power (Stigler, 1947; Hannan & Berger, 1991). However, studies investigating price friction per se have been few, despite economists placing great importance on price stickiness (Carlson, 1992). Blinder, 1991; Carlson, 1992; and Hannan, 1994; test for price friction by analysing the number and frequency of price. Both Carlton, 1986; and Carlson, 1992; calculate average duration between price changes, and its standard deviation, as measures of price rigidity. In Berger & Udell, 1992; an OLS regression of the loan rate premium against market indicator rates is undertaken to test for the rigidity of prices, and to find measures of the elasticity of loan rate premium relative to changes in the market or indicator rate, to calculate an estimate of the price rigidity.

METHODOLOGY AND DATA

Using a similar method to that employed in Hannan, 1994; and Carlson, 1992; the number and frequency of changes in bank variable mortgage rate are calculated. In addition, the duration to the next change in mortgage rates, and its standard deviation, are calculated, and to gain a richer understanding of the extent of price friction in the bank variable mortgage market, the size of the changes in variable mortgage rates are also analysed. Monthly bank variable mortgage rate data is used, similar to Hannan, 1994; Carlson, 1992; Carlton, 1986; and Berger & Udell, 1992. The data, obtained from the Reserve Bank of Australia (RBA), covers the period from January 1959 to December 1996.

The analysis of price friction, uses the calculation of the elasticity of changes in variable mortgage rate premia relative to changes in the market rate, similar to Berger & Udell, 1992; employing ordinary least squares (OLS) and tests the following function, where PREM(t), the variable housing loan rate premium at time t, is the difference between the variable mortgage rate, ht, and an indicator or market rate, BAB(t), which influences the rate charged on variable housing loans.

$$PREM(t) = a + b_1.BAB(t) + b_2.BAB(t)^2 + s(t)$$

The combination of BAB(t) and BAB(t) squared, allows the measurement of open-market rates and summarises credit market conditions at each t (Blinder, 1991). BAB is measured using the 90 day bank accepted bill rate (supplied by the RBA), the main indicator rate impacting variable mortgage rates in Australia. The period examined for the elasticity estimates is July 1969 to August 1999. The elasticity measure is found by using the estimated equation above to calculate the change in PREM of a increase in BAB by 100 basis points, using the mean values.

NUMBER, FREQUENCY AND DURATION OF RATE CHANGES

The results of the number and frequency analysis are shown in Table 1. Over the total period examined, there were 31 increases and 30 decreases, with changes occurring every 7.5 months, on average. In the 288 months of the first sub-period, banks changed the rate 22 times, 18 of which were increases and four decreases, a change on average, every 13 months. During the second sub-period, banks made 31 changes (10 increases and 21 decreases), a change every four months on average. The third sub-period saw little difference from the previous period, with changes every 5.25 months on average. These results indicate evidence of the existence of price friction and further, that it has reduced over time.

Table 1: Number and Size of Variable Rate Mortgage Changes											
Period	No. of increases	No. of decreases	No. of changes	No. of Months of Change	Proportion of Increases (%)	Proportion of Decreases (%)	% Of Months In Which Change Occurred	Ratio of decreases to increases	Average Duration to Change (months)	Std Dev of Duration to Change (months)	Mean Variable Mortgage Rate over period (%)	Std Dev of Variable Mortgage Rates (%)
Banks:												
Jan '59 to Dec, '82	18	4	22	288	81	18	8	0.22	13.09	12.33	7.34	2.37
Jan '83 to June '93	10	21	31	126	32	68	25	2.10	4.06	3.99	13.57	2.14
Jul '93 to Dec '1996	3	5	8	42	38	63	19	1.67	5.25	5.83	9.66	0.79
Totals	31	30	61	456	51	49	13	0.97	7.48	8.91		
Building Societies												
Jan '83 to June '93	40	64	104	126	0.3846	0.6154	0.8254	1.6000	1.2115	1.4873	13.9568	1.9634
July '93 to Dec '96	9	17	26	42	0.34	0.65	0.62	1.89	1.62	2.54	9.60	0.72
Totals	49	81	130	168	0.38	0.62	0.77	1.65	1.29	1.81		
Mortgage Managers												
July '93 to Dec '96	15	19	34	42	0.44	0.56	0.81	1.27	1.24	1.11	8.59	0.48

ELASTICITY OF VARIABLE MORTGAGE RATES

The results of the OLS regression of the variable housing rate premium against the market indicator rate are shown in Table 2. As suggested by [5], the coefficients of BAB and BAB2 are difficult to interpret, and it is more meaningful to examine the summary statistic that measures the elasticity of the bank variable mortgage rate to changes in the indicator rate, shown at the bottom of Table 2. The results covering the entire period, show that the variable housing loan premium is expected to fall by 7 basis points, following a 100 basis point increase in BAB. This suggests a small amount of stickiness relative to market rates, but is substantial when noted that it represents 22.6 percent of the average spread over the 90 day bank bill rate for the period. In the first sub-period there is a small amount of stickiness, 9 basis points, indicating that a delay in rate change will cause a drop in the average premium of 11.0 percent. In the second sub-period, a 100 basis point shock to the funding rate would incur a drop in the premium of 40 basis points, or over 56 percent. In the final sub-period, the degree of stickiness falls, to 11 basis points, or 4.4% of the housing loan rate spread over BAB.

Table 2: Results of OLS Regression (t statistics in brackets)				
Variables	Jul 1969 to Aug 1999	Jul 1969 to Dec 1982	Jan 1983 to Jun 1993	Jul 1993 to Aug 1999
Constant	0.0261**	0.0100**	0.0605**	0.0109
	(4.0557)	(1.5846)	(5.3464)	(0.9127)
BAB	0.0034	0.1230	-0.1801	0.3739
	(0.0318)	(1.0648)	(-0.9324)	(1.0101)
BAB^2	-1.9572**	-2.8986**	-1.6965*	-2.2852
	(-3.5696)	(-5.8935)	(-2.1519)	(-0.7818)
Price friction of 100 bp increase in BAB rate	-0.0007**	-0.0009**	-0.0040**	0.0011**
	(-39.4870)	(-23.1364)	(-20.8915)	(-5.1551)
Price friction relative to average PREM (%)	22.58	11.06	56.66	4.41
** significant at the 1% level* significant at the 10% level				

PRICING BEHAVIOUR, PRICE CHANGE ASYMMETRY AND COMPETITION

The results of the analysis of number and frequency of rate changes and the elasticities indicate that the degree of stickiness in the Australian variable mortgage market changes over time. Further, as the time periods examined correspond to a large extent to changing competitive regimes in the market, the degree of stickiness may be related to market factors such as the competitive environment. The extent of asymmetry in bank rate changes was tested using the OLS results, to estimate the elasticity of the bank premium over 90 day BAB to a fall in 90 day BAB by 100 basis points. The resulting elasticity calculations are shown in Table 3. Table 3 reveals that a change in rates by 100 basis points does not produce a symmetrical impact on the bank premium on bank variable mortgage rates over 90 day BAB in any period examined.

There appear to be differences in the market friction in bank variable rate mortgages relative to that of bank competitors. Table 1 data suggests that the variable rate mortgages issued by Australian banks display far greater price friction than those of either the building societies or the mortgage managers. This indicates that, while there are common market influences impacting the pricing in the three groups, there may be other institutional specific issues, in addition to market factors, impacting the decision to change rates. Because the variable mortgage rate setting is discretionary, the differences across the different institutional groups suggest that each has different decision criteria impacting changes in variable mortgage rates.

SUMMARY AND CONCLUSIONS

The analyses of the number and frequency of variable mortgage rate changes, the size and distributions of increases and decreases, and the elasticities of rate changes, show evidence of the

existence of market friction in the Australian variable rate mortgage market. The results also show that there are differences in price stickiness between increasing rates and decreasing rates, suggesting different decision criteria. The findings also show that there have been shifts in price stickiness over time, indicating changes in bank pricing behaviour. Further, bank variable mortgage rates appear to be more sticky than those of bank competitors, indicating different decision rate determination criteria across institutions.

As the least market friction was found during a period of increasing consumer awareness, the findings are consistent with Carlson, 1992 that price stickiness reduces as asymmetric information in the lender's favour reduces, producing increased consumer responsiveness (Hannan, 1994; Ball & Mankiw, 1995) and reduced market power (Stigler, 1947; Neumark & Sharpe, 1992). The analysis in this paper, while important in itself, provides useful input into further analysis of variable mortgage interest rate changes, enabling a better understanding of the risks associated with variable mortgage rates, Australian style.

Table 3: Results of Test of Price Change Asymmetry (t-statistics in brackets)		
Period of Analysis	Price friction of 1% increase in BAB rate	Price friction of 1% decrease in BAB rate
July 1969 to August 1999	0.0007**	0.0071**
	(-39.487)	(-39.491)
July 1969 to December 1982	-0.0009**	0.0081**
	(-23.136)	(-23.135)
January 1983 to June 1993	-0.0040**	0.0084**
	(-20.892)	(-20.891)
July 1993 to August 1999	0.0011**	-0.0009**
	(-5.155)	(-5.155)
** significant at the 1% level		

REFERENCES

Ball, L. and N. G. Mankiw (1995). Relative-price Changes as aggregate Supply Shocks, *Quarterly Journal of Economics*, February, 161-193.

Barro, R. (1972). A theory of Monopolistic Price Adjustment, *Review of Economic Studies*, 39, January, pp. 17-26.

Berger, A. N., and G. F. Udell (1992). Some Evidence on the Empirical Significance of Credit Rationing, *Journal of Political Economy*, 5(100) October, 1047-77.

Blinder, A. S. (1991). Why are Prices Sticky? Preliminary Evidence from an Interview Survey, *American Economic Review*, 81, May, 89-96/

Carlson, J. A. (1992). Some Evidence on Lump Sum Versus Convex Costs of Changing Prices, *Economic Inquiry*, 30 (April), 322-331.

Carlson, J. A. (1990). Customer Sensitivity to Relative Prices and the Frequency of Price Changes, paper presented at the American Economic Association meeting, Washington, D. C., December.

Carlton, D. (1986). The Rigidity of Prices, *American Economic Review*, 76 September , 637-658.

Hannan, T. (1994). Asymmetric Price Rigidity and the Responsiveness of Customers to Price Changes, *Journal of Financial Services Research*, 8, 257-267.

Hannan, T. and A. N. Berger (1991). The Rigidity of Prices: Evidence from the Banking Industry, *American Economic Review*, 81, September, 938-945.

Mankiw, N. G. (1985). Small Menu Costs and Large Business Cycles: A Macroeconomic Model of Monopoly, *Quarterly Journal of Economics*, 100(2), 529-538.

Neumark, D. and S. A. Sharpe (1992). Market Structure and the Nature of Price Rigidity: Evidence from the Market for Consumer Deposits, *Quarterly Journal of Economics*, 107(2), 657-680.

Primeaux, W. J. and M. R. Bombull (1974). A Re-examination of the Kinky Oligopoly Demand Curve, *Journal of Political Economy*, 82, July/August, 851-862.

Simon, J. L. (1969). A Further Test of the Kinky Oligopoly Demand Curve, *American Economic Review*, 59, December, 432-449.

Stigler, G. J. (1947). The Kinky Oligopoly Demand curve and Rigid Prices, *Journal of Political Economy*, 55, October, 432-449.

Stiglitz, J. (1985). The Causes and Consequences of the Dependence of Quality on Price, *Journal of Economic Literature*, March, 25, 1-48.

REACHING THE CUSTOMER-INTERNET BANKING AS A DISTRIBUTION CHANNEL

Rae Weston, Macquarie University

ABSTRACT

The key attributes of internet banking are that location and time become irrelevant in the access to banking services. Nevens (1999) in a well-known comparison suggests that the cost per transaction for internet banking is a fraction of that for traditional channels.

It is the argument of this paper is that as a stand-alone distribution channel, the internet will be at least as expensive to provide as more traditional channels. This result is due to a mis-specification of the infrastructure which though differently defined in the case of the internet nevertheless exists.

INTRODUCTION

Clarke (2001,at p 160) suggests that even when brand switching is just a click away customer retention remains the key to long term profits and there is a high cost penalty to low loyalty. This paper explores the issue with respect to internet banking .

The key attributes of internet banking are that it makes both location and time irrelevant with respect to access to banking services. What is different about internet banking is that it is a consumer-voluntary channel, that is, no matter how attractive and informative the site , nor how cheap the services it provides, the consumer must volunteer to access the site.

In this paper the experiences of "stand-alone" internet banking is compared with that of banks for whom the internet is just an additional channel. From the insights provided through this comparison, we discuss the cost of access issue

Howcroft and Kiely (1995) suggest that internet-based distribution channels reduce the entry barriers into retail banking and make it easier to cover a larger geographical area. On the other side, Angelides (1997) and Baer(1998) find that problems with technical and legal security comprise a significant barrier to success, while Birch and Young (1997) argue that a further problem may be how to convince new customers that they can trust the bank, especially if it is not well-known and has no significant physical presence.

Mols et al (1999) notes a key point that "the diffusion of electronic banking is more determined by customer acceptance than by seller offerings". This suggests that internet banking provides the first entirely "consumer- voluntary" channel, as opposed to other distribution channels where seller offerings dominate.

Sathye (1999) reports from an empirical investigation of the adoption of internet banking by Australian consumers that 78% of personal respondents had security concerns about internet banking.73% were unclear about the benefits or added value of internet banking, 60% regarded pricing/cost aspects as barriers and 50% were resistant to change.

STAND-ALONE INTERNET BANKING

In May 1995 Huntington Bancshares and Wachovia Corporation each invested $US1.2 m. each in the development of a complete internet-based bank. Created and designed by Cardinal Bancshares and funded by the other two financial services providers, the Security First Network Bank was launched in October 1995.

Nevens (1999) suggests that as a branch transaction costs $1.08,while the same transaction on the internet costs 13 cents or less, the internet's major is to reduce the cost of "the searching ,coordinating and monitoring that people and companies must do when they exchange goods, services or ideas." For a mortgage transaction Nevens claims that their cost would drop by as much as 80% when handled only electronically.

Security First Network Bank's channel of distribution was the internet selling of core deposit and lending products at a lower cost than those of competitors. The bank struggled to get customers past the early adopter stage and failed to reach profitability. It opened branches on the east and west coast of the USA but was still unable to attract profitable customers. In March 1998 it was acquired by the Royal Bank of Canada which was able to provide banking expertise, access to funds and an established bank brand.

First Direct was set up in 1989 as a division of Midland Bank. It was established as a direct marketing channel for rebranded Midland Bank products built around a call centre using Midland's core systems. The business was unprofitable at first due to establishment costs and the cost of attracting customers.

In New Zealand Ergo was launched in 1996 as a stand-alone direct bank offering home mortgages, term deposits and insurance over the telephone, through the internet and some selected mortgage brokers. It was funded by deposits and from the wholesale market. It offered cheaper loan rates and competitive deposit rates, but failed to generate sufficient customer base in its first year to continue. The next year it was relaunched as Ergo-an AMP Company which added brand strength to the business and lifted its level of activity, but did not improve its cost-income ratio to the predicted 25 to 30% for direct operations.

Internet Banking as an additional channel

The clear advantage of this strategy is that it enables the bank to leverage off its brand. Clarke (2001) suggests that bank customers fall into one of five categories:

1.	"aggrieved"-likely to switch to a competitor at the first opportunity;
2.	"seducible"-believe they may be better served by switching to a competitor
3.	"passive"-no significant ties of loyalty to existing bank
4.	"contented"-believe their current bank is in many ways superior to alternatives
5.	"brand champions"-ambassadors for their current bank

Where an existing bank offers internet banking as an additional channel, it will immediately attract those in categories 4 and 5 who have the following characteristics; they are connected to the internet for e-mail and for information searching about their special interests (Katz and Aspden,1997) are price-conscious, affluent and well-educated and do not put a high value on their personal relationship with the local branch (Evans and Wurster,1999, Katz and Apsden,1997,Rosen,1997).

Further, categories 4 and 5 are less likely to have security or trust concerns with respect to a new channel of distribution offered by their existing bank. Even if security was a concern to them, they may believe that their bank would fix any problems that arose.

ASB Bank in New Zealand decided to launch a direct bank after market research suggested that consumers were attracted to this channel by low cost rates and fees and 24 hour access. The target market was identified as busy people who valued their time and were comfortable with the technology. it was discovered that a link with an established bank to establish expertise and financial strength was necessary. The bank's five reasons for the launch were to attract new customers; to improve customer profitability because the direct bank would operate with new low cost technology, process automation, and a small staff; ;to prototype systems and processes for the parent bank; to develop marketing and retailing skills. The need to control the switch of customers from established to direct bank; the establishment of a unique value proposition to the consumer based on convenience service and lower cost; and the first mover advantage by being the first to market with a direct bank to gain "mind share" were seen to be the critical success factors.

A major advertising campaign communicated the initial offer of 24 hour access via telephone, Internet and ATM EFT-POS to home loans, personal loans, transaction accounts, VISA cards and home and contents insurance with a new low market rate for home loans. Customers were attracted by the low home loan rates and were then cross-sold other products. As anticipated most customers were busy people comfortable with the technology.

Commonwealth Bank of Australia which launched Commonwealth Direct in 1997 to manage telephone banking and to deliver on-line services has leveraged off the Commonwealth Bank brand very successfully and by 1999 had attracted 2.5 million customers. It was also providing 25,000 product sales per annum. For Commonwealth Direct the Internet enables information to be presented to the customer; facilitates comparison; reduces entry barriers and has been a significant change catalyst. The security and trust aspects associated with the Commonwealth brand have been instrumental in the acceptance of internet channels not only by existing Commonwealth Bank customers but by customers migrating from other banks.

The Bank also has the opportunity through communication with its existing customers to make clear to them the benefits or added value that internet banking might offer. Sathye's (1999) survey reported that 86% of personal customers would like the benefits of internet banking to be explained to them before they would consider adopting it.

There will be opportunities to reach the "seducible" and "aggrieved" categories of other banks, provided they can establish communications with them. It is this last issue, communication which must incorporate marketing the internet banking opportunity is crucial for both the attraction and retention of customers.

It is this aspect which is crucial and is required continuously if the economies of scale of internet banking are to be achieved. It is argued here that it is the continuous expenditure on

marketing which is the equivalent of "infrastructure spending" for this channel, that is the crucial element for success in internet banking if it is offered as a stand-alone enterprise.

       It may readily be seen from the examples discussed earlier of internet-only banks that they were all unable to reach critical mass on their own. In contrast established banks, such as Commonwealth Bank and ASB that add an internet channel to their range of distribution channels, are able to leverage off their brand, especially with respect to the aspects of trust and security. This suggests that Nevens' information about transaction costs reflects the variable costs with respect to internet banking but not the fixed costs.

REFERENCES

Angelides, M.C. (1997) Implementing the Internet for Business: a global marketing opportunity" *International Journal of Information Management,* vol 17 No 6

Baer, W. S. (1998) "Will the internet bring electronic services to the home?" *Business Strategy Review,* Vol 9 No 1

Birch, D. and M.A. Young (1997) "Financial services and the Internet-what does Cyberspace mean for the financial services industry?" *Internet Research: Electronic Networking Applications and Policy*, Vol 7 No 2

Clarke, Ken (2001) "What price on loyalty when a brand switch is just a click away? " *Qualitative Market Research: An International Journal*, Vol 4 No 3

Evans, P.B. and T. S. Wurster(1999) "Strategy and the New Economics of Information" *Harvard Business Review*, vol 75 No 5

Howcroft, B and J. Kiely "Distribution Channels" in Ennew, C. T. Watkins, M. Wright *Marketing Financial Services,* Vol 4 Issue 3

Katz ,J. and P. Apsden (1997) "Motivations for and barriers to Internet usage: results of a national public opinion survey" *Internet Research: Electronic Networking Applications and Policy* Vol 7 No 3

Mols, N.P. P.N.D Bukh and J.F. Nielsen (1999) "Distribution Channel Strategies in Danish Retail Banking" *International Journal of Retail and Distribution Management*, Vol 27 No 1

Nevens, T. Michael (1999) "The mouse that roared" *The McKinsey Quarterly*, No 1

Rosen, R.(1997) "Standing out from the online crowd" *Bank Management,* Vol 7 No 3

Sathye, M. (1999) Adoption of Internet Banking by Australian consumers: An empirical investigation" *International Journal of Bank Marketing*, Vol 17, No 7

TREADING AN UNEASY PATH?
THE SECURITIZATION OF GATE RECEIPTS

Rae Weston, Macquarie University

ABSTRACT

This paper considers the securitization of gate receipts by UK football clubs in the context of the more usual structures of securitisation. The usual definition of securitization is as a process by which assets are sold by their owner and re-financed by their purchaser through the issue of securities backed by the cash flow from the assets, In essence the process packages illiquid financial assets in such a way as to be able to sell participations in the package to investors. This allows the illiquidity to be swapped for liquidity. A key characteristic required of the asset or flow of income to be securitized is that it should have certainty. Recent securitizations have moved to a greater extent than previously away from this key characteristic. This paper examines the recent securitizations undertaken by UK football clubs from this standpoint.

INTRODUCTION

This paper considers the securitization of gate receipts by UK football clubs in the context of the more usual structures of securitisation. The usual definition of securitization is as a process by which assets are sold by their owner and re-financed by their purchaser through the issue of securities backed by the cash flow from the assets, In essence the process packages illiquid financial assets in such a way as to be able to sell participations in the package to investors. This allows the illiquidity to be swapped for liquidity

Securitization has also been described as the process of distributing risk by aggregating debt instruments into a pool and issuing new securities based on the pool ; and as the issuing of traded financial instruments against anticipated cash flows of interest and principal from various kinds of receivables.

For an issuer the advantages of securitization are liquidity, a substantial reduction in the cost of funding, a diversification of the investor base which allows new sources of capital to be exploited and a reduction in the balance sheet. For securitization to be feasible for an organisation it is necessary for it to identify a receivable that is homogeneous and available as a steady stream and which can easily be rated investment grade.

The risks applicable to securitization are credit risk; liquidity risk; interest rate risk; fraud or other invalidity; legal uncertainties and changes; reliance on experts; structural risks; insurance risk and the risk of downgrading.

The securitization process has five stages:

Stage One:	Identify a pool of assets with a regular stream of cash flows
Stage Two:	Transfer these to a bankruptcy remote entity to insulate against the seller's credit risk
Stage Three:	Create a structure to package the cash flows supported by internal and/or external credit enhancement
Stage Four:	Provide external liquidity support to bridge the gap between the asset cash flow and the payment obligations on the securities
Stage Five:	Iissue securities backed by the asset pool and supported by credit enhancement and liquidity

Since the process was introduced in the 1970s with the securitization of mortgages in the US the range of assets securitized has continually extended. An at least partial list is cars, boats, equipment leases, recreational vehicles and light trucks, credit card receivables, consumer loans, trade receivables, affiliate notes, insurance policy loans, hospital receivables, home equity loans, time shares, junk bonds, middle market commercial industrial loans , LDC debt, and publishing rights. One of the more recent applications is reported in the European Commission's ART Market Study Final Report (October 2000)at p.16. This is catastrophe securitization where the cedant issues a bond under which the issuer or cedant is allowed to "default" on the bond in the event of an insured or trigger event occurring. The "default" may refer to capital, coupon or both. The securities are written so that the non-payment that occurs with the trigger event does not formally constitute a default on the debt and accordingly has no impact on the issuer's credit rating.

While an early paper described "the securitization of practically everything" (1985), it is really only in the past few years that the list of applications has burgeoned. Standard and Poor's (2000) remarked that securitisation was being embraced by investors because securitized instruments were of comparatively high quality and low volatility and the opportunities they offered for portfolio diversification. In this paper we consider the securitization of gate receipts by UK football clubs in the light of past experience and assess whether they are an appropriate application of the technique. The approach taken will be to describe a traditional securitization process in detail and then to compare the gate receipt securitization with it to enable the differences to be identified. Certificates for amortising revolving credits (or CARDS) were developed based on the steady stream of credit card receivables a bank had. The receivables varied in quality. The bank identified a static pool of credit card balances of good quality and decided to sell participations in the pool. To do so a special purpose vehicle (SPV) was created to hold the credit card receivables and to issue certificates to buy these that would pay out for a certain period. The credit enhancement issue is dealt with by obtaining a guarantee from a AAA rated entity, or by overcollateralisation, which has already been done in this case by pooling assets to a much higher value than that issued, or by the creation of subordinated tranches

Placement, the next stage involved pricing. distribution and transferring the securities

The securities could have been privately placed, and this may be a good option in cases where the underlying asset has not been used as the basis for securitisation before. If, as is more usual, the issue is underwritten ,the underwriter may make a market. Finally the bank as the originator of the receivables received a servicing fee.

THE GATE RECEIPT CASES

The Ipswich Town ,Leicester City, Newcastle United, Tottenham Hotspur and Leeds United Football Clubs in the Uk have all securitized gate receipts. We will examine in detail the structure of the Newcastle United securitisation. The club securitized its match ticket and corporate hospitality receipts to raise 55 million pounds for the extension of its ground, St James' Park and for general corporate purposes. The funds raised were repayable over 17 years and had an average fixed annual interest rate of 7.43%,a then advantageous commercial rate.

The securitisation process differed from that already outlined in several respects ;first the nature of ticket and hospitality receipts did not allow a legally assignable book debt to be created. This problem was overcome by setting up a new company (Newco) to take a sub-lease of St James' Park from the club and by this process acquiring the right to ticket and hospitality revenue. A second difference was the less predictable nature of the revenues than for most securitizations and therefore the risk of reduced attendances over the 17 period, perhaps related to team performance had to be covered. A third issue was that Newcastle had substantial brought forward tax losses which they wished to remain available for set-off against future profits from match day receipts; and fourth, the club did not want the funding to restrict its normal operations and needed to maintain full flexibility with respect to player signings which could not wait for trustee consent.

The structure established to cope with these issues was for an SPV to issue the bonds and lend the money raised to Newco which then lent the funds to the club. Newco received a sub-lease of the stadium from the club and commissioned the club to operate the stadium and to play its home matches there/ The club receives a fee for its work and rent under the sub-lease, both of which are set-off against the loan repayments due to Newco from the club.

Security for the revenue flows was achieved by the creation of a cash management agreement between all the parties that provided for all ticket and hospitality revenue to be paid into a specified bank account from which monies were paid out into a series of accounts in a specified order to ensure sufficient funds would be available to service the payments to be made to investors. Once this is done, cash is paid back to the club in rent and fees under the service agreement. This arrangement is allowing the club to expand its ground, from which further gate receipts could well be received.

On the other hand, LeedsUnited Football Club launched a $US71 m securitisation of its gate receipts in order to recoup funds it had spent buying players to reach champion-challenging level. and Ipswich Town raised 25 million pounds securitizing ticket receivables to fund growth and restructuring when the club had only just been promoted to the Premier League and would also play in Europe.

While these clubs have loyal fan bases and capacity-constrained stadiums which combined with the widespread use of season tickets does put a level of support under the levels of ticket

income, it is curious that securitization is being favoured at a time when the underlying assumptions may well be changing. Traditionally, clubs playing in the Premier League attract the largest crowds and a club being relegated to the first division would lose much of that attraction. The recent participation of UK clubs in the European competition creates a new level of club that plays in Europe. The Premier League clubs that fail to qualify to play in Europe form a second level and the first division clubs are now a distant third. Where securitized funds are being spent in some cases on gaining players to make a mark in the European competition, it remains to be seen whether this does not become a vicious circle when these players leave and must be replaced.. The credit enhancement issue which here is the guarantee of the persistency of substantial ground revenues seems to be the critical issue. This in effect needs to be a guarantee that the club will at the very least maintain a presence in the Premier League and appear not too rarely in Europe.

It is suggested that potential investors in such issues should pay particular attention to two particular aspects of the securitizations by football clubs; first that there are long-term benefits for the club from the funds received; and second, that the credit enhancement arrangements are sufficient to deal with the realistic expectation, however repugnant to a loyal fan, that by no means the full period of the securitisation will coincide with the club playing in both Europe and the Premier League.

REFERENCES

Anonymous (2001) "Insurers revisit risk-transfer securitization" *Asset-Backed Alert* ,October 1

Änonymous (1985)"The Securitization of Practically Everything", *Institutional Investor,* May

Beckwith, Roger (2001) "Current Trends in risk-linked securitisation" *Risk Management*, August

Johnson, Mark (2001) "Sport and finance play together" *Global Finance*, June

Kaplan, Harold L. and Timothy R. Casey (2001) "The intricate role of securitisation trustees" *Trust and Investments* ,September

Mahul, Olivier (2001) "Managing catastrophic risk through insurance and securitisation" *American Journal of Agricultural Economics*, August, Vol 83, No 3

O'Neill, Aidan and Ronan White (2001) "Secure in the Knowledge" *Financial Management*, June

Peterson, James R. (2001)"Mixed bag for securitisation" *ABA Journal*, September

Standard and Poor's (2000) "The Investor Perspective: The Benefits of Buying Securitised Bonds" *Ratingsdirect*, November 28

Voisey, Peter (2001) " Prologis sets landmark for real estate securitisation" *International Financial Law Review*, June, Vol 20 No 6

AN EXPERIMENT USING ABC-BASED VALUE INDEXING FOR BANK SERVICES

Ross Quarles, Sam Houston State University
Leroy Ashorn, Sam Houston State University
James Bexley, Sam Houston State University

ABSTRACT

This paper outlines a process for improving cost-based data for management decision making regarding services offered by banks. The process described here utilizes the concept of value indexing to relate relative customer preferences for a bank service to the relative cost of providing that service. Determination of this relationship can assist bank management in making decisions regarding which services to eliminate and/or which to enhance as well as to indicate areas for potential cost reductions. While value indexing is not a new concept, the use of activity based costing (ABC) to quantify the cost variable in the equation is a relatively new application. In addition, the inclusion of some metric to address quality (such as value indexing) in cost management models, such as ABC, has been suggested in regard to value engineering. This paper describes the concepts supporting ABC-based value indexing and the results of a simulation case exercise involving bank managers that applies those concepts to bank services.

Authors' Index