Bond University
ePublications@bond

School of Business Discussion Papers | Bond Business School

7-1-1995

Firm performance and macro-economic variables

Ray McNamara
Bond University, Ray_Mcnamar@bond.edu.au

Keith Duncan
Bond University, Keith_Duncan@bond.edu.au

Follow this and additional works at: http://epublications.bond.edu.au/discussion_papers

Part of the Macroeconomics Commons

Recommended Citation

McNamara, Ray and Duncan, Keith, "Firm performance and macro-economic variables" (1995). *School of Business Discussion Papers.* Paper 66.
http://epublications.bond.edu.au/discussion_papers/66

This Discussion Paper is brought to you by the Bond Business School at ePublications@bond. It has been accepted for inclusion in School of Business Discussion Papers by an authorized administrator of ePublications@bond. For more information, please contact Bond University's Repository Coordinator.

BOND UNIVERSITY
School of Business

DISCUSSION PAPERS

"Firm Performance and Macro-economic Variables"

Ray McNamara
and
Keith Duncan
School of Business
Bond University

DISCUSSION PAPER NO 59

July 1995

University Drive,
Gold Coast,QLD,4229
AUSTRALIA

SCHOOL OF BUSINESS
DISCUSSION PAPERS

Bond University was established by Act of Parliament in 1987 as an independent, private University. The first student intake occurred in May 1989. The School of Business offers degrees in the undergraduate (BCom, BHospMgt and Diploma) and the graduate (MBA, MAcc, MCom, MTM and PhD) levels.

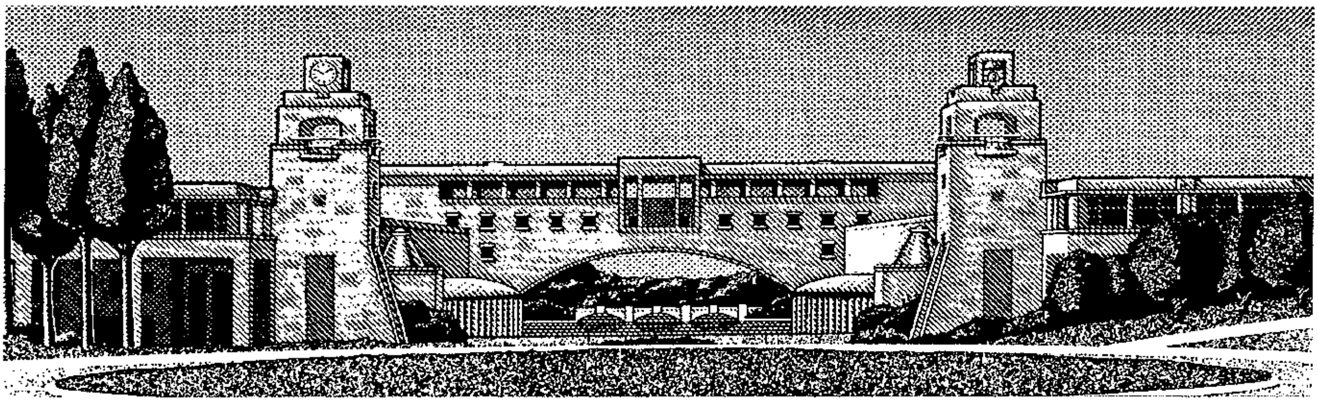
The School teaches and sponsors research in accounting, economics, econometrics, finance, marketing, management, organisational behaviour and related disciplines in hospitality and real estate fields.

The Discussion Paper series is intended to foster research and comments are invited. The views expressed in the papers are the opinion of the authors and do not necessarily reflect the views of the School or the University.

Lists of available Discussion Papers and copies of the papers (which are free of charge) may be obtained from:

The Senior School Administrator
School of Business
Bond University
GOLD COAST QLD 4229

Telephone: (07) 5595 2244
Fax: (07) 5595 1160



B O N D U N I V E R S I T Y

Firm Performance and Macro-economic Variables

By

Ray McNamara
Associate Professor of Accounting,

and

Keith Duncan
Assistant Professor of Accounting and Finance,

Draft: April 1994

Contact Address and Numbers:

School of Business,
Bond University,
Robina,
Queensland 4229,
Australia

Home (64 75 302455)
Work (64 75 952238)
Fax (64 75 951160)

Firm Performance and Macro-economic Variables

Abstract

This purpose of this research is to predict the fundamental performance of a firm as measured by the rate of return on assets (ROA). The paper presents a model relating ROA to prior year ROA and to the level of activity in the economy. A principal components' analysis of thirty-three economic indicators was used. The variables used were drawn from the main theories/perspectives on macro economic behaviour. These were the *Leading and Coincident Indicators* perspective, *Supply or Cost-Push Theories*, *Monetary Economics*, and *Savings-Investment* theories. Three factors emerged and were labelled as an Output Factor, Interest Factor, and a Corporate Activity Factor. A four variable model incorporating a lead-lag relationship of ROA, percentage change in Gross Domestic Product (the output factor), prior year interest rate on Treasury Notes (the interest rate factor), corporate profits (the corporate activity factor) was significant. R^2 values in excess of .65 indicates considerable aggregate explanatory power. We conclude that firm performance is a function of the prior year ROA, and macro-economic variables. The lead lag model suggests that earnings forecasts may be made based on the model presented in this study.

INTRODUCTION

The purpose of this paper is to analyze the fundamental firm performance in the context of macro-economic variables. The study's major proposition is that the rate of return on assets of a firm is a function of a fundamental business-performance level and government economic policy (measured by macro-economic indicators). Extensive research has shown the importance of earnings information to capital markets (Ball and Brown, 1968; Beaver Lambert and Morse, 1980; Beaver, Clark, and Wright, 1979). Ou and Penman (1989) highlighted the importance of earnings as a value relevant variable for security returns. They concentrated on identifying those financial statement variables that were able to predict a change in the direction of future earnings. Our concern is with the prediction of the absolute value of future earnings.

Prediction of future earnings is of interest to investors, analysts, management, and auditors. Investors are assumed to make their investment decisions on the basis of their assessment of future earnings. Analysts advise clients on a range of valuation relevant matters including investments, new issue valuation, and takeover valuation. Management is vitally concerned with future earnings prediction for budgetary and control purposes while auditors would benefit form profit forecasts in their analytical reviews of clients financial statements. These reasons are part of the motivation for this research into forecasting rate of return on net tangible assets.

Previous research on the time series properties of earnings suggests that earnings follow a random walk (Foster, 1986, Whittred, 1978, Caird and Emanuel, 1981). To date the most accurate source of forecast of firm performance is analysts forecasts (Brown Foster, and Noreen, 1985, Ali and Klein, 1992, Griffin, 1977, Brown and Rozeff, 1979). However, the failure of time series models to provide adequate forecasts of earnings per share is the fact that they attempt to forecast a variable that is the result of several other functions. Specifically, earnings per share is a function of fundamental earning capacity of the firm, the firms capital structure, interest rates, and government taxation policy. A firms fundamental earnings capacity is further modified by the level of economic activity as dictated by government policy with respect to the economic management.

The failure of time series models to outperform analysts' forecasts is not surprising given the factors that contrive to change the earnings per share from one period to the next. This research predicts seventy percent of the variation in a firms fundamental earnings capacity as represented by the rate of return on assets.

Conceptual Framework

General Model

Limited work has been performed on the prediction of accounting ratios. Most ratio related research focuses on the ability of financial statement related ratios to predict corporate failure (Beaver, 1966, 1968; Altman et al., 1977; Ambrose and Seward, 1988, McNamara et al. 1989). The exception to failure research is the early work by Solomin (1966), Vatter, (1966), and Livingstone and Salamon (1970) attempted to reconcile accounting return-on-assets to internal rate of return. Jensen (1970) highlighted the benefits for valuation studies if we could obtain an accurate description of the process generating firm income. Recently, the resurgence in the valuation literature (Ohlson, 1989, Ou and Penman, 1989) lead to attempts to advance reconcile the rate of return on equity with traditional concepts of value (Brief and Lawson, 1992).

Penman (1990) investigated the properties of the rate of return on equity (ROE). He concluded that ROE is primarily at profitability measure but also concluded that :

> *"ROE is not sufficient for distinguishing future profitability and thus is not a satisfactory summary measure for financial statement analysis. A further research question is whether (and how) a decomposition of ROE might improve the assessment of future profitability."* (Penman, 1990, p. 253)

In this paper we argue for rate of return on assets as the best decomposition of ROE for the purposes of predicting future profitability. Figure 1 present our general model for profit generation for corporations.

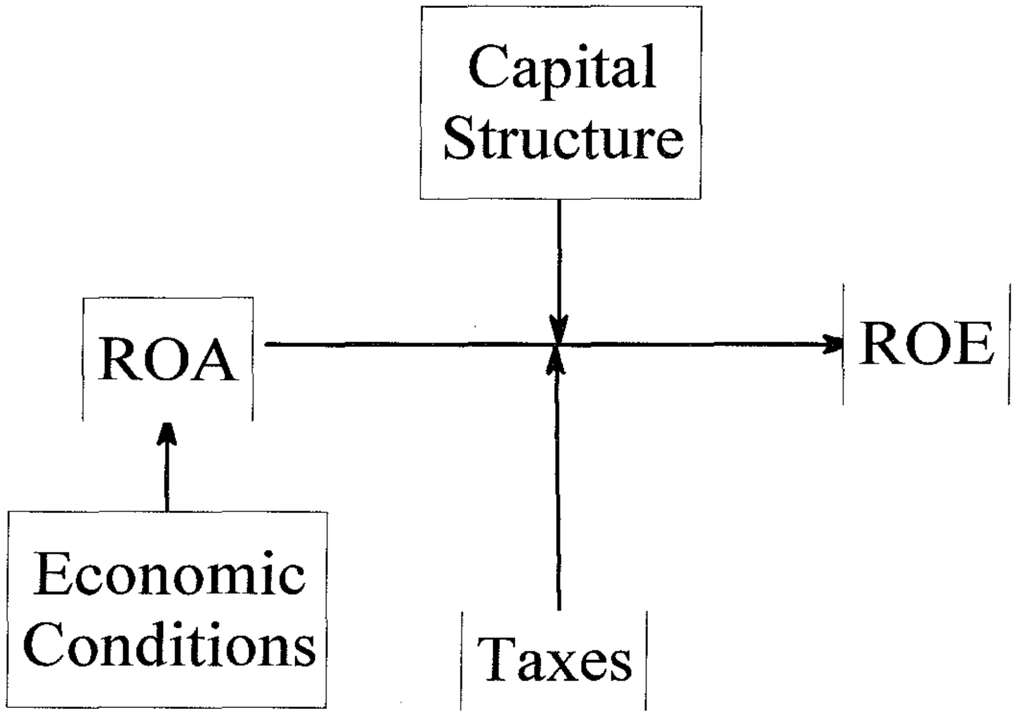


Figure 1:
Model of
Profit
Performance

The essential elements of the model is a fundamental operating capability of a firm (ROA), leakages of earnings through both payments to capital, and the final return to equity holders. As stated in the introduction, the resultant returns to equity are determined by an interaction of a number of factors. First, a firm's base-operating capacity in any one year is determined by its asset base and the costs of its other factors of production. Specifically, we assume that profits finally available to shareholders is a fixed function of the firms asset base. Traditional financial statement analysis focuses on the rate of return on assets (ROA) as measured by the earnings before interest, tax, and extraordinary items, divided by net tangible assets (Stigney, 1990; Popoff and Cowan, 1989). In an organization working to full capacity with competitively determined and effectively utilized other factors of production, the ROA will measure its surplus generating capability. The model assumes this base surplus generating capacity will be modified by the general level of economic activity. The obtained level of ROA will depend on the demand for the firms goods and services in any one particular year which in turn will be the subject of the governments general management (or mismanagement) of the economy. Management capability to manage its factors of production in any given year will result in will result in individual firm differences. To the extent that these differences are relatively consistent over time, they should be captured in the ROA estimation.

In addition, ROA is a measure before the transitory components of earnings regularly reflected in the extraordinary items classification in Australian corporate income statements. Accordingly, it limits the ability of firms to smooth earnings (although not completely).

The remainder of the model presents the leakages from the base surplus that determine the final returns to equity holders. Specifically the capital structure and changes in that structure effect distributions to shareholders because they have the first call on funds generated. This leakage is further effected by changes in interest rates which are in turn integrally related to general economic activity. The second leakage is through corporate taxes. In Australia, there have been numerous changes in the effective tax rates in the last two decades. These leakages make time series predictions of returns to equity (either ROE or EPS) virtually impossible.

However, if the future return on assets is predictable, then the profit before interest and tax can be calculated and then adjusted for the known leakages on a firm specific basis. This research restricts its interest to the prediction of ROA. The fundamental hypothesis that guides the empirical research is that ROA, as a measure of base operating performance of a firm, is correlated with changes in the level of economic activity. The general form of the relationship is:

$$ROA_t = f(ROA_{(t-1)}, Econ)$$

Where:

ROA = Rate of Return on Assets

E*con* = Level of Economic Activity

The macro-economic variables

The macro economic variables chosen for this research were the Australian equivalents of the variables identified by Rose et al. (1982). They drew their measures of economic activity according the *Leading and Coincident Indicators*, *Supply or Cost-Push Theories*, *Monetary Economics*, and *Savings-Investment* theories. These theories provided an initial data set of 33 variables as listed in Table 1.

INSERT TABLE 1

Method

The Sample

Annual financial statement information was gathered manually for the period 1978 to 1991. Forty one companies representing those from the top sixty Australian companies (by market capitalization) for which data was available for the prescribed time period. Macro economic data was obtained from the DX Statistical Data Base at Bond University. The period 1978 to 1991 was chosen because it was the period for which information was available for all macro economic variable in the study.

For the firms chosen, detailed financial statement information was collected from the annual reports. Rate of Return on Assets was calculated for each company based on earnings before interest, extraordinary items, and taxes and net tangible assets as at balance date.

Mode of Analysis

The data analysis comprises two stages:

(1) Principal component analysis of the economic indicators to produce a reduced set of economic factors.

(2) Regressing the ROA and the economic factors identified in the initial analysis on one, two, and three year ahead ROA.

The variables suggested by the various macro economic theories are undoubtedly correlated. Accordingly, the purpose of principal components stage of the analysis is to identify those variables whose variability is related to some underlying factor. The factors found in this stage of the analysis will be the result of a varimax rotation and thus their orthogonality is enhanced. The second stage applies the statistical technique of a pooled regression on the key economic variables and the lagged ROA.

Analysis and Results

Stage 1: Principal Components Analysis

A varimax principal components analysis was applied to the macro economic variables. Three factors were extracted based on a scree test applied to the eigen values. The eigen value graph is shown in Figure 2.

INSERT FIGURE 2

The rotated factor matrix for the principal components analysis are shown in Table 2. Three factors emerged and were labelled as an Output Factor, Interest Factor, and a Corporate Activity Factor. These three factors accounted for seventy percent of the total variance. It would appear that the no one macro economic theory explains the nature of the factors that emerged from the analysis.

INSERT TABLE 2

The purpose of the factor analysis was to reduce the macro economic variables to a parsimonious-orthogonal set. Based on the vary high loadings in the factor analysis stage, real GDP (GDP_R), the Treasury Note rate (IR_TNOTE), and aggregate corporate profits after tax (COYPAT) were used in the prediction of ROA. The alternative would be the use of a composite score for each factor based on the factor coefficients obtained from the analysis. Because of the inherent susceptibility of factor analysis to the errors in the value of the variables and to the variables included/excluded in the analysis, it was decided to use the variables with the highest loading for the regression model. However the strong trend in GDP_R suggests that it would be inappropriate to use this variable directly in the ROA forecast model. Consistent with most economic models percentage change in nominal GPD (CHGGDP) was used instead of GDP_R for the subsequent analysis.

Model

As discussed ROA is modelled as a function of prior ROA observations and macro economic variables. While the factor analysis identified the macro economic variables for the model there is little guidance as to the process which may be generating the realized ROA series. ROA may follow a moving average or autoregressive or mixed process. Thus the first step in estimating the model is to explore the time series properties of ROA using Box-Jenkins methods.

The autocorrelation and partial autocorrelation functions for ROA were plotted. The plots indicated that ROA followed an autoregressive process with a one period lag (ie. an AR1 process) as the partial autocorrelation function was flat after one period. Thus the model estimated included a one period lag of ROA as one of the independent variables.

Two versions of the model were estimated with different lagged values for change in GDP (CHGGDP), interest rates as embodied in the treasury note interest rate (IR_TNOTE), and aggregate corporate profits after tax (COYPAT). The two versions of the model are as follows:

MODEL 1:

$$ROA_t = \alpha + \beta_1 ROA_{t-1} + \beta_2 CHGGDP_t + \beta_3 IR\_TNOTE_{t-1} + \beta_4 COYPAT_t + \varepsilon_t$$

MODEL 2:

$$ROA_t = \alpha + \beta_1 ROA_{t-1} + \beta_2 CHGGDP_t + \beta_3 IR\_TNOTE_{t-2} + \beta_4 COYPAT_{t-1} + \varepsilon_t$$

This model was estimated for the pooled data set in a pooled cross-sectional time-series estimation. Pooled cross-sectional regression is appropriate where one is interested in the population regression coefficients. This assumes that the M individual company regression coefficients are drawn from a population with a common set of regression coefficients (ie. vector $\bar{\boldsymbol{\beta}}$). In this case the M individual company models can be pooled to obtain a more efficient estimator of $\bar{\boldsymbol{\beta}}$ (Judge *et al*, 1985, 1988; Dielman, 1989). The equation system is written as:

$$\mathbf{Y} = \mathbf{Z}\,\bar{\boldsymbol{\beta}} + \mathbf{e}$$

where:

$$\mathbf{Y} = \begin{bmatrix} Y_{i,1} \\ Y_{i,2} \\ \vdots \\ Y_{i,M} \end{bmatrix} \quad \mathbf{Z} = \begin{bmatrix} X_{ij,1} \\ X_{ij,2} \\ \vdots \\ X_{ij,M} \end{bmatrix} \quad \text{, and} \quad \mathbf{e} = \begin{bmatrix} \varepsilon_{i,1} \\ \varepsilon_{i,2} \\ \vdots \\ \varepsilon_{i,M} \end{bmatrix}$$

and $\bar{\boldsymbol{\beta}}$ is a K x 1 vector of coefficients to be estimated. Further the components of the disturbance vector **e** are assumed to be cross-sectionally homoskedastic (ie. have a constant variance, $E(\varepsilon_i\varepsilon_i') = \sigma^2 I_T$) and to be time-series uncorrelated (ie. zero auto correlation, $E(\varepsilon_{it}\varepsilon_{js}') = 0,\ t \neq s$). If these assumptions are violated then the OLS estimates for the pooled cross-sectional time-series model will be inefficient and incorporating information about the structure of the disturbances (eg. through a different estimation technique) will produce more efficient estimates for the coefficient vector $\bar{\boldsymbol{\beta}}$. Thus in pooled cross-section time-series regression it is important to test for violation of these assumptions.

If the disturbances are heterogeneous, as would seem reasonable for different companies, then more efficient coefficients can be obtained from a generalized least squares (GLS) estimation weighting the M individual company Y_i and X_{ij} matrices by $\hat{\sigma}_i^{-1}$.

Autocorrelation in the disturbances is possible if the dependent variable follows an autoregressive process. Kmenta (1986) has suggested a GLS methodology that relaxes the assumptions of cross-sectional homogeneity and zero autocorrelation and estimates a pooled model allowing for cross-sectional heteroskedasticity and time-series autocorrelation (also see White *et al*, 1990; Dielman, 1989).

Tests of assumptions

Initially the models were estimated using OLS pooled estimation and then a series of tests were performed for violation of assumptions concerning the disturbance vector. A Breusch-Pagan-Godfrey test for heteroskedasticity was performed. The Breusch-Pagan-Godfrey test statistic η was significant for both models (Model 1 $\chi^2_{\alpha=0.01,df=4} = 11.91$, Model 2 $\chi^2_{\alpha=0.01,df=4} = 12.07$) indicating heterogeneous disturbances (White *et al*, 1990, p. 90.; Judge *et al*, 1985, pp. 446-447). White's test for heterogeneous disturbances (and other misspecifications) was also significant for both models (Model 1: $\chi^2 = 3.92$, $p < 0.05$, Model 2: $\chi^2 = 3.81$, $p < 0.10$) suggesting that the disturbance for the OLS model are not homoskedastic (White *et al*, 1990, p. 90; Judge *et al*, 1985, pp. 453). Durbin's h statistic, which is normally distributed with a mean of zero and unit variance, for the OLS estimation of Model 1 was 3.91, and for Model 2 the statistic was 3.81. Both of these statistics are significant ($p < 0.001$) indicating significant serial correlation in the disturbances. This is consistent with the autocorrelation analysis reported above for ROA and suggest that the model follows an autoregressive process.

As the errors display serial correlation and there was some evidence of heteroskedasticity, the model can not be estimated using ordinary least squares. These are classic problems associated with cross-sectional time-series modelling. To overcome these problems the model was re-estimated using generalized least squares with adjustments for serial correlation and heteroskedastic errors. Essentially a special case of the more general Kmenta (1986) type models was used.

The results for the estimation of Models 1 and 2 respectively are reported in Tables 3 and 4. Model 1 provides significant explanatory power (Model 1: $F= 611.1$, $p < 0.000$). All the independent variables in Model 1 are significant at the one per cent level or better except for contemporaneous aggregate corporate profits after tax (significant at $p < .05$). Lagged ROA and percentage change in GDP (CHGGDP) are positively related to one period ahead ROA. Lagged interest rates (LIR_TNOTES) and contemporaneous aggregate corporate profits (COYPAT) are negatively related ROA. The autoregressive parameter RHO was estimated for each cross-sectional unit. The same RHO parameter was estimated for all cross-sectional units to be $\rho = 0.1269$. The final model did not exhibit any first order serial correlation as Durbin's h statistic (h =0.693, $p > 0.20$) was insignificant.

INSERT TABLE 3

Model 2 also provides significant explanatory power (Model 2: $F= 471.3$, $p < 0.000$). All the independent variables without exception are significant at the one per cent level in Model 2. The autoregressive parameter RHO estimated for all cross-sectional units was $\rho = 0.1386$. Model 2 did not exhibit any first order serial correlation as Durbin's h statistic (h =0.071, $p > 0.20$) was insignificant. In Model 2, two period lagged interest rates (L2IR_TNOTES) and one period lagged corporate profits (LCOYPAT) are negatively related to ROA. This is not inconsistent with Model 1 and accords with other economic findings with respect to interest rates.

INSERT TABLE 4

The results show a significant relationship between ROA and the lagged value for ROA, percentage change in GDP (CHGGDP), the treasury note interest rate (IR_TNOTE), and corporate profits after tax (COYPAT). ROA and change in GDP are positively related to future ROA while the coefficients for various lagged values for interest rates and corporate profits are negative. It would seem that increases in the level of economic activity, as measured by GDP, are accompanied by increases in ROA. This result fits with the notion that increases in economic activity flow through to sales activity (ie. asset turnover ratio) and thus positively affect ROA (ie. asset turnover is a component of

ROA). Interest rates one and two periods ahead affect ROA through their impact on costs of factors of production. This is consistent with the Australian evidence that there is a two year lag between interest rates movements and changes in GDP. The company profit variable captures those economic factors that are specific to the corporate sector and not reflected in aggregate GPD movements.

The R^2 values of .70 for Model 1, and .65 for Model 2, indicate considerable aggregate explanatory power for the estimated models. By previous research standards, this is an impressive result and significantly better than the result obtained with ROA. Other lag relationships were considered as were variations to the economic measures (real GDP, quarterly GDP etc.). None provided the level of explanatory power as the reported relationship.

Conclusion

The purpose of this study was to explain and predict the base performance of a firm as represented by ROA and macro economic variables. The results, though preliminary, are promising. Both four variable models incorporating lead-lag relationships have an R^2 between .65 and .70. We conclude that firm performance is a function of the prior year ROA, and macro-economic variables. The lead lag model suggests that earnings forecasts may be made based on the model presented in this study. To the extent that government forecasts of GDP are reasonably accurate, earnings forecasts of at least one year may be made. To the extent that macro-economic variables are influenced by government policy this research shows the connection between that policy and firm performance. Future research involving the predicting of any accounting variable, particularly those derived from ROA, such as earnings or rate of return on equity, must consider the impact of macro-economic as well as firm-specific micro data.

BIBLIOGRAPHY

Ali A., and Klein, A., and Rosenfeld, J., "Analysts' Use of Information about Permanent and Transitory Earnings Components in Forecasting Annual EPS", *Accounting Review,* Vol. 67, January 1992.

Altman, E.I., "Financial Ratios, Discriminant Analysis, and the Prediction of Corporate Bankruptcy", *Journal of Finance,* September, 1977 pp. 589-609.

Ambrose, J.M. and Seward, J.A., "Best Rating Financial Ratios and Prior Probabilities in Insolvency Prediction", *The Journal of Risk and Insurance,* June, 1988 pp. 229-244.

Ball and Brown, "An Empirical Evaluation of Accounting Income Numbers", *Journal of Accounting Research,* Autumn, 1968 pp. 159-178.

Beaver, W.H., "Financial Ratios as Predictors of Failure", *Journal of Accounting Research,* Supplement 1966 pp. 71-111

______, W.H., "Alternative Accounting Measures as Predictors of Failure", *Accounting Review,* January 1968 pp. 113-122.

______, W.H., Clark, R., and Wright, W., "The Association Between Unsystematic Security Returns and the Magnitude of Earnings Forecast Errors", *Journal of Accounting Research,* Autumn 1979 pp. 316-340.

______, W.H., Lambert, R., and Morse, D., "The Information Content of Security Prices", *Journal of Accounting and Economics,* 2, March 1980 pp. 3-28.

Brief, R.P., and Lawson, R.A., "The Role of the Accounting Rate of Return in Financial Statement Analysis", *The Accounting Review,* (1992), pp. 411-426.

Brown, P., Foster, g., and Noreen, E., "Security Analyst Multi-Year earnings Forecasts and the Capital Market", *American Accounting Association,* 1985

Brown, L. D., and Rozeff, M.S., "Univariate Time-Series Models of Quarterly Earnings per Share: A Proposed Model", *Journal of Accounting Research,* Spring 1979, pp. 179-189.

Caird, K.G. and Emanuel, D., "Some Time-Series Properties of Accounting Income Numbers", *Australian Journal of Management,* December, 1981 pp. 7-15

Foster, G., *Financial Statement Analysis 2ed.,* Prentice Hall, New Jersey, 1986,

Griffin, P.A., "The Time Series Behavior of Quarterly Earnings: Preliminary Evidence", *Journal of Accounting Research,* Spring, 1977, pp. 71-83.

Jensen, M., "Discussion of the Time Series Behavior of Earnings", *Journal of Accounting Research*, Autumn, 1970 pp. 100-103.

Livingstone, J.L., and Salamon, G.L. "Relationship Between the Accounting and the Internal rate of Return Measures: A Synthesis and Analysis", *Journal of Accounting Research*, Autumn, 1970 pp. 199-216

McNamara, R.P., Cocks, N., Hamilton, D., "Predicting Private Company Failure", *Accounting and Finance*, Vol.28, No.2, November,1988 pp.53-64

Penman, S.H., "An Evaluation of Accounting Rate-of-return", *Journal of Accounting, Auditing & Finance*, (1990), pp. 233-255.

Popoff B, and Cowan, T K, *Analysis and Interpretation of Financial Statements* , 3rd Ed, (Butterworths, 1989).

Rose, P.S., Wesley, T.A., and Giroux, G.A., "Predicting Business Failure: A Macro-Economic Perspective", *Journal of Accounting, Auditing & Finance*, (1982), pp. 20-31.

Solomon, E. Return on Investment: "The Relationship Between Book Yield to Time Yield" In "Research in Accounting". Jaedicke, R.K., Ijiri, Y., and Neilsen, O., eds. *American Accounting Association*, 1966

Stickney, C.P., *Financial Statement Analysis: A Strategic Perspective*, (Harcourt Brace Jovanovich, 1990)

Vatter, W.J., Income "Models, Book Yields and Rate of Return", *Accounting Review*, October 1966, pp.681-698.

Watson, C.J., "Multivariate Distributional Properties, Outliers, and Transformation of Financial Ratios", *Accounting Review*, July, 1990. pp.682-695.

Whittred, G., "The Time Series Properties of Quarterly Earnings", *Australian Journal of Management*, October, 1978, 105-202

(1) Unemployment Rate
(2) Private Final Consumption Expenditure - actual
(3) Private Final Consumption Expenditure - real (1989 dollars)
(4) Gross Domestic Product - actual dollars
(5) Output per Hour - real
(6) Gross Domestic Product - real (1989 dollars)
(7) Private Final Consumption Expenditure Index
(8) Interest Rates - Treasury Notes
(9) Interest Rates - Australian Savings Bonds
(10) Corporate Taxes
(11) Normal Unit Labour Costs (proportion)
(12) Household Disposable Income - real
(13) Corporate Profits
(14) Corporate Profits after Tax
(15) Private Sector : Total Portfolio
(16) Seasonally Adjusted Gross Domestic Product
(17) Money Supply - M3
(18) Interest Rates - Money Market
(19) Interest Rates - Two Year Bond Rate
(20) Interest Rates - Five Year Bond Rate
(22) Interest Rates - 90 Days
(21) Interest Rates - 90 Days
(23) Yield Curve - QTR
(24) Household Savings
(25) Gross Savings to GDP
(26) Seasonally Adjusted Total Capital Expenditure
(27) Investment Index
(28) All Groups Production Index
(29) Retail Sales
(30) Retail Sales to GDP
(31) Private Final Consumption Expenditure: Household Durables
(32) Durable Goods to GDP
(33) Private Gross Fixed Capital Expenditure

TABLE 1: Economic Activity Indicators

Var No.	*Description*	*Factor 1*	*Factor 2*	*Factor 3*
(6)	GDP_R	.99131	-.02790	.11696
(2)	P_CONEXR	.98569	-.07519	.13399
(12)	HDI	.98539	-.06584	.09773
(16)	GDP_SA	.98429	.00230	.15241
(4)	GDP_MKT	.98390	.02169	.14514
(3)	P_CONEXP	.98354	-.02472	15718
(5)	OUTP_HR	.98282	.01538	.15794
(7)	PI_CONSE	.98181	-.02937	.16443
(31)	PC_HHDUR	.98132	.00538	.17833
(17)	MON_M3	.97486	-.15395	.06113
(29)	QT_RETAI	.97403	.02613	.10394
(11)	WAGE_R	.96720	.01823	.19473
(32)	DG_GDP	.95601	.05147	.23523
(30)	RETAIL_S	.95015	.05316	.15835
(26)	SA_TOT_K	.93471	.27286	.07813
(27)	INV_INDE	.93471	.27286	.07813
(24)	TREHHSAV	.90760	-.17305	-.11515
(10)	CORPTAX	.89165	-.19982	.15701
(9)	IR_ASB	-.82514	.22121	.19165
(25)	GRSA_GDP	.76110	-.24322	-.23066
(33)	PLT_EQ	.71273	.59953	.00315
(15)	PV_PORT	.67779	.45207	.29618
(8)	IR_TNOTE	.05662	.97188	.03757
(19)	IR_2YR	-.07431	.94815	-.01844
(18)	IR_MM	.18085	.93645	.10726
(20)	IR_5Y	-.08229	.88596	-.01209
(22)	IR_90D	.04950	-.83160	-.00811
(23)	YIELDCUR	.04950	-.83160	-.00811
(21)	IR_10Y	-.08622	.79845	-.00538
(1)	UNEMP	.38957	-.51753	.44093
(14)	COYPAT	.12010	.29093	.81449
(28)	ABS_PROD	-.02147	.23285	-.73832
(13)	CORP_PRO	.51939	.12533	.69482

TABLE 2: Rotated Factor Matrix

VARIABLE NAME	ESTIMATED COEFFICIENT	STANDARD ERROR	T-RATIO 528 DF	P-VALUE	PARTIAL CORR.	STANDARDIZED COEFFICIENT
ROA_1	0.49750	0.3656E-01	13.61	0.000	0.510	0.5030
CHGGDP	0.14262	0.5357E-01	2.662	0.004	0.115	0.0188
LIR_TNOTES	-0.24917E-02	0.1080E-02	-2.307	0.011	-0.100	-0.0171
COYPAT	0.27968E-05	0.1600E-05	1.748	0.041	0.076	0.0086
CONSTANT	0.74791E-01	0.1916E-01	3.903	0.000	0.167	0.0000

R-SQUARE BETWEEN OBSERVED AND PREDICTED = 0.6978

TABLE 3: Pooled Analysis of Crossectional and Time-Series Variables for Model 1

VARIABLE NAME	ESTIMATED COEFFICIENT	STANDARD ERROR	T-RATIO 528 DF	P-VALUE	PARTIAL CORR.	STANDARDIZED COEFFICIENT
ROA_1	0.44961	0.3772E-01	11.92	0.000	0.460	0.4546
CHGGDP	0.15485	0.3991E-01	3.880	0.000	0.166	0.0204
L2IR_TNOTES	-0.21969E-02	0.8374E-03	-2.623	0.004	-0.113	-0.0153
LCOYPAT	-0.58633E-05	0.1477E-05	-3.970	0.000	-0.170	-0.0183
CONSTANT	0.95240E-01	0.1427E-01	6.673	0.000	0.279	0.0000

R-SQUARE BETWEEN OBSERVED AND PREDICTED = 0.6474

TABLE 4: Pooled Analysis of Crossectional and Time-Series Variables for Model 2

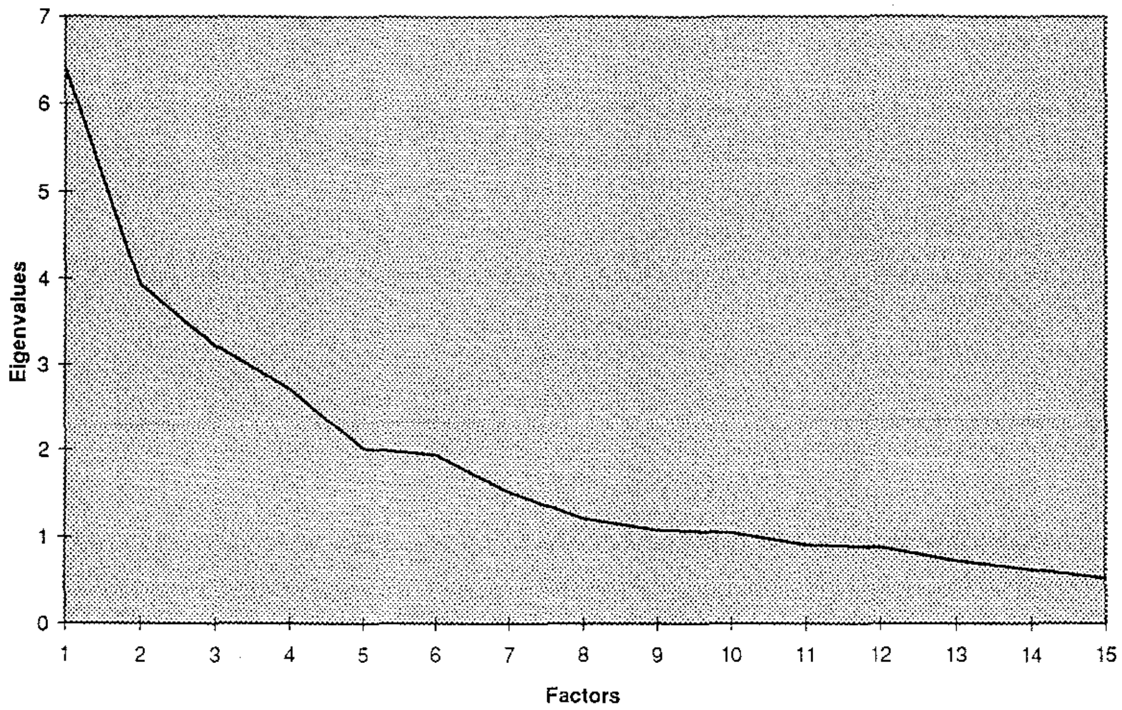


FIGURE 2: Scree Plot of Eigen Values