WORKING PAPERS

ASSET REVALUATIONS AND SHARE PRICES

A Study Using the M.S.A.E. Regression Technique

by

T. P. TRUONG

No.10 February 1977

IN ECONOMICS

DEPARTMENT OF ECONOMICS

UNIVERSITY OF SYDNEY

ASSET REVALUATIONS AND SHARE PRICES

A Study Using the M.S.A.E. Regression Technique

by

T. P. TRUONG

No.10 February 1977

National Library of Australia card number
and ISBN 0 909426 58 9

I should like to thank Dr I.G. Sharpe for suggesting the topic of this study, and Professor W.P. Hogan and Dr Viv. Hall for comments on the earlier draft.

ASSET REVALUATIONS AND SHARE PRICES

A Study Using the M.S.A.E. Regression Technique

1 Introduction

A recent paper by Sharpe and Walker [13] examined the effect of changes in accounting methods on stock market prices. Contrary to the common view that "changes in accounting methods do not appear to have had much of an effect on stock market prices",[1] they concluded that

> "...the failure of accounting to *systematically* provide contemporary information about the affairs of firms can deprive the stock market of valuable information and lead to the inequitable treatment of individual investors."[2]

This study extends the work of Sharpe and Walker by applying an alternative method to their data in order to test and supplement the results produced by the Ordinary Least Squares (O.L.S.) method.

2 The Sharpe and Walker Model

The model employed by Sharpe and Walker was the so-called market model. Using the ordinary least squares method, the yield on company shares was regressed against a portfolio or "market" yield, and the residual term then attributed to the influence of asset revaluation. If the residual term remained high, this meant that revaluation had boosted the market price of the shares. Movements of the residual term over a relevant period of time were assumed to indicate the market's response to news of a revaluation.

The Sharpe and Walker data were selected from asset revaluation cases recorded on a file compiled within the Department of Accounting, University of Sydney. Various criteria were applied to ensure that only "true" revaluation cases were selected. The final sample was composed of 34 asset revaluations by 32 listed companies and is shown in Table 1, Appendix III. This sample was then disaggregated into two groups. The first consisted of companies whose dividends increased in the twelve months following the revaluation (after allowing for capital changes). The second group comprised companies whose dividends did not increase or declined after the revaluation. The first group included 18 revaluation cases, and the second 16 (see Table 1, Appendix III).

According to Sharpe and Walker, the reason for disaggregating the sample into these two groups was to examine whether the movements in prices (if any) were in fact due to information about earnings rather than information about asset revaluations. If the patterns of the residuals for both these groups were similar, then it must be concluded that price movements were in fact due to asset revaluation announcements.

3 Choice of Alternative Estimation Method

The size of the residual term in the market model depends on the choice of regression method. Sharpe and Walker used the ordinary least squares method. There are some objections to the use of this method. Firstly, the distribution of share price changes are generally known to deviate from the normal or Gaussian distribution. More precisely, empirical distributions are believed to follow a non-normal Stable distribution which exhibits the feature of "infinite variance" (see Appendix I). If this is so, the ordinary least squares method - which is based on the minimisation of the variance - will not be suitable, because the variance is infinite. Furthermore, "infinite variance", in fact, implies the presence of many more extreme observations in the empirical data than are assumed by a Gaussian distribution. Because the ordinary least squares method is highly sensitive to extreme observations (due to the greater weights it attaches to the large residuals) it can produce results significantly biased in the direction of extreme observations.

Besides the stable distribution, there are other and possibly more attractive forms of distribution. Preatz [10] and Blattberg and Gonedes [2] have suggested the scaled t-distribution believing that it has greater validity than the symmetric Stable distribution. However, it is beyond the scope of this study to investigate all possible distribution models and their implications for the ordinary least squares method. Instead, we concentrate on a comparison between the normal and non-normal Stable distributions only.

Several authors have suggested alternative methods to be used for the case of non-normal Stable distributions. Wise[3] suggested the method of Best Linear Unbiased Estimator (B.L.U.E.). Mandelbrot [5] and Fama [3] suggested the method which Minimises the Sum of Absolute Errors (M.S.A.E.).

The choice of either the B.L.U.E. or the M.S.A.E. estimators depends on the empirical value of the characteristic exponent α. Blattberg and Sargent [1] found in a sampling study that if the characteristic exponent α is less than 1.7 the M.S.A.E. method outperforms the O.L.S. method.[4]

Furthermore, the margin [5] in favour of the M.S.A.E. method is much greater than that in favour of the O.L.S. when $\alpha > 1.7$. In short, the M.S.A.E. estimator is more robust than the O.L.S.

Comparing the M.S.A.E. and the B.L.U.E. methods, one finds that the latter is less flexible in the sense that it requires knowledge of the exact value of α. Furthermore, Blattberg and Sargent also found that the M.S.A.E. outperforms even the best of the B.L.U.E.'s for small values of α's.

The validity of the O.L.S. method used in the Sharpe and Walker study depends essentially on the empirical estimate of the characteristic exponent α of Australian share price distributions. If α is close to 2, the use of the O.L.S. method is justified. However, if α is much less than 2, the M.S.A.E. method should be considered.

Empirical studies on Australian share price distributions are few, and the conclusions are not unanimous. Most authors agree that the empirical distributions of share price changes show significant deviations from the normal distribution. However, the majority still doubt the Stable distribution as a useful or valid model. Officer [7] for example, found that certain empirical properties were inconsistent with the Stable hypothesis and believed that the sample standard deviation was still a well behaved measure of dispersion. Preatz [10] found that distributions of share price changes were "highly non-normal" and "well-defined", but that these well-defined distributions were more likely to be a scaled t-distribution than a Stable distribution [11]. In fact, only the work of D. Osborne [7] supported the Stable hypothesis and produced results which showed that the characteristic exponent α of the Australian share price distributions was around 1.7 (this, incidentally, is the border value where the M.S.A.E. method starts to compete with the O.L.S. method).

Even though most empirical studies do not completely support the Stable hypothesis, they unanimously reject the normal hypothesis as unsuitable for the study of share price changes. As a result, there is a strong case for testing an alternative method of estimation which can be used in place of, or in addition to, the O.L.S. method.

Compared to the O.L.S. method, the M.S.A.E. method is more attractive because it is simpler in concept (though not necessarily simpler in the method of solving), i.e. minimisation of the sum of absolute deviations instead of the sum of squares of the deviations.

4 The Results

The market model used by Sharpe and Walker is described by the following relations:

$$R_{it} = a_i + b_i R_{mt} + u_{it}$$

Where

t denotes the month, varying from -12 to +12; t=0 denotes the month of the revaluation announcement.

R_{it} denotes the monthly return for company 'i' in month 't' calculated from end of month prices and including dividends as well as appropriate adjustments for stock splits, bonus issues and 'rights'.

R_{mt} denotes the 'market' rate of return, represented by the average monthly rate of return on a portfolio consisting of some 500 Australian stocks traded on the Melbourne Stock Exchange assuming dividends are re-invested and adjustments made for capital changes.

a_i represents the riskless rate of return.

b_i is a measure of the volatility of the return on company i's share relative to the market return.

u_{it} is the residual term for company 'i' in month 't'.

The term $b_i R_{mt}$ represents the effect of market-wide influences on the company's return. The residual term u_{it} accounts for other influences, namely the influence of asset revaluation announcement and random disturbance. In order to eliminate the latter, the residual term is averaged over the sample of 34 revaluation cases (or 18, for the group in which dividends increased, and 16, for the group in which dividends decreased or remained steady) to produce an Average Residual for month t (AR_t) :

$$AR_t = \frac{1}{n} \sum_{1}^{n} u_{it} \quad (n=34,18,\text{or } 16)$$

The Cumulative Average Residual for month t is defined as:

$$CAR_t = \sum_{-12}^{t} AR_t$$

By plotting AR_t and CAR_t against the month t, the movement in prices as a result of an upward asset revaluation announcement can be observed.

The results are presented in Tables 4,5 and 6 in Appendix III and in Figures 1,2, and 3.

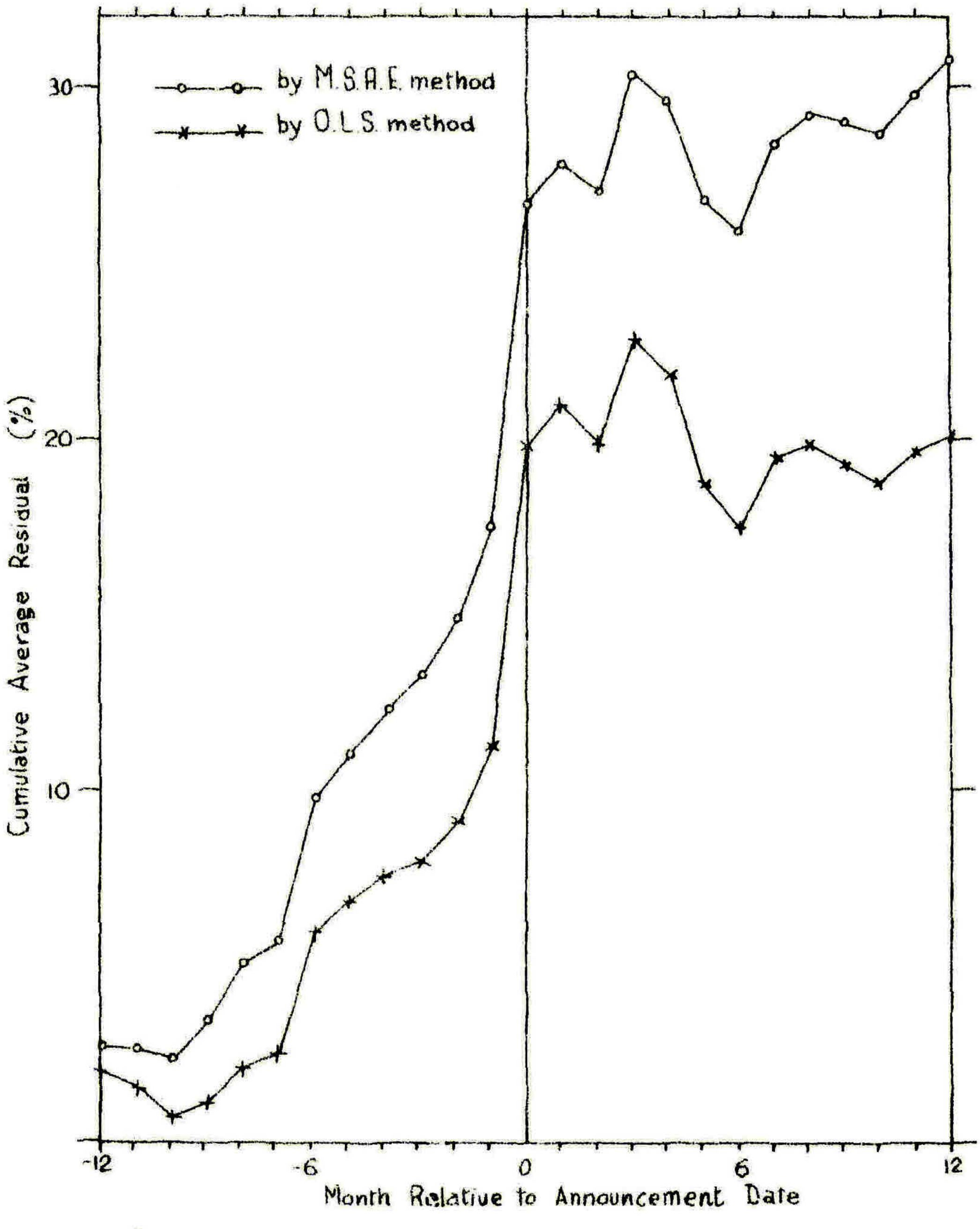

Fig. 1 – Cumulative Average Residuals for 34 revaluation cases

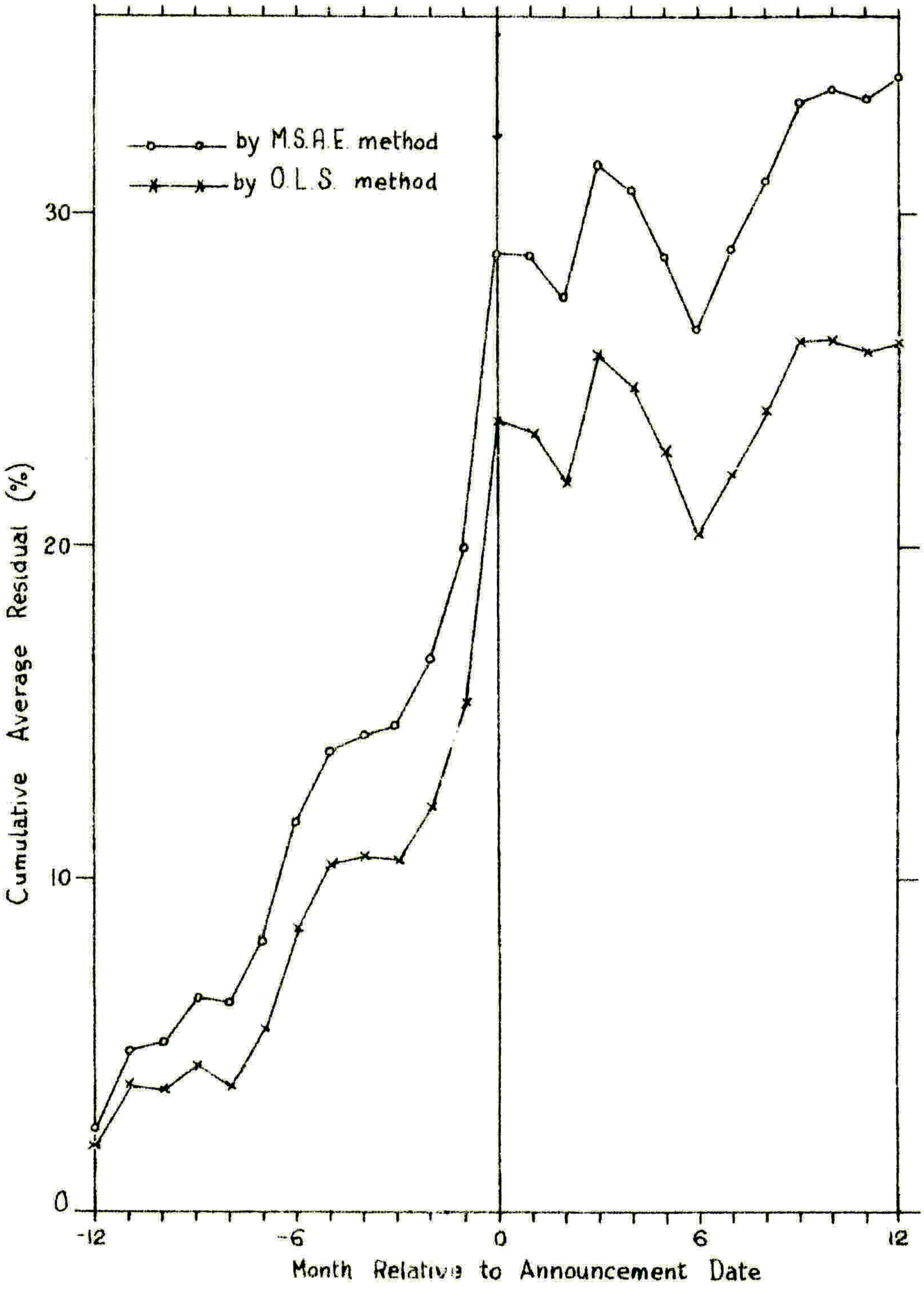

Fig. 2 – Cumulative Average Residuals for dividend "increases"

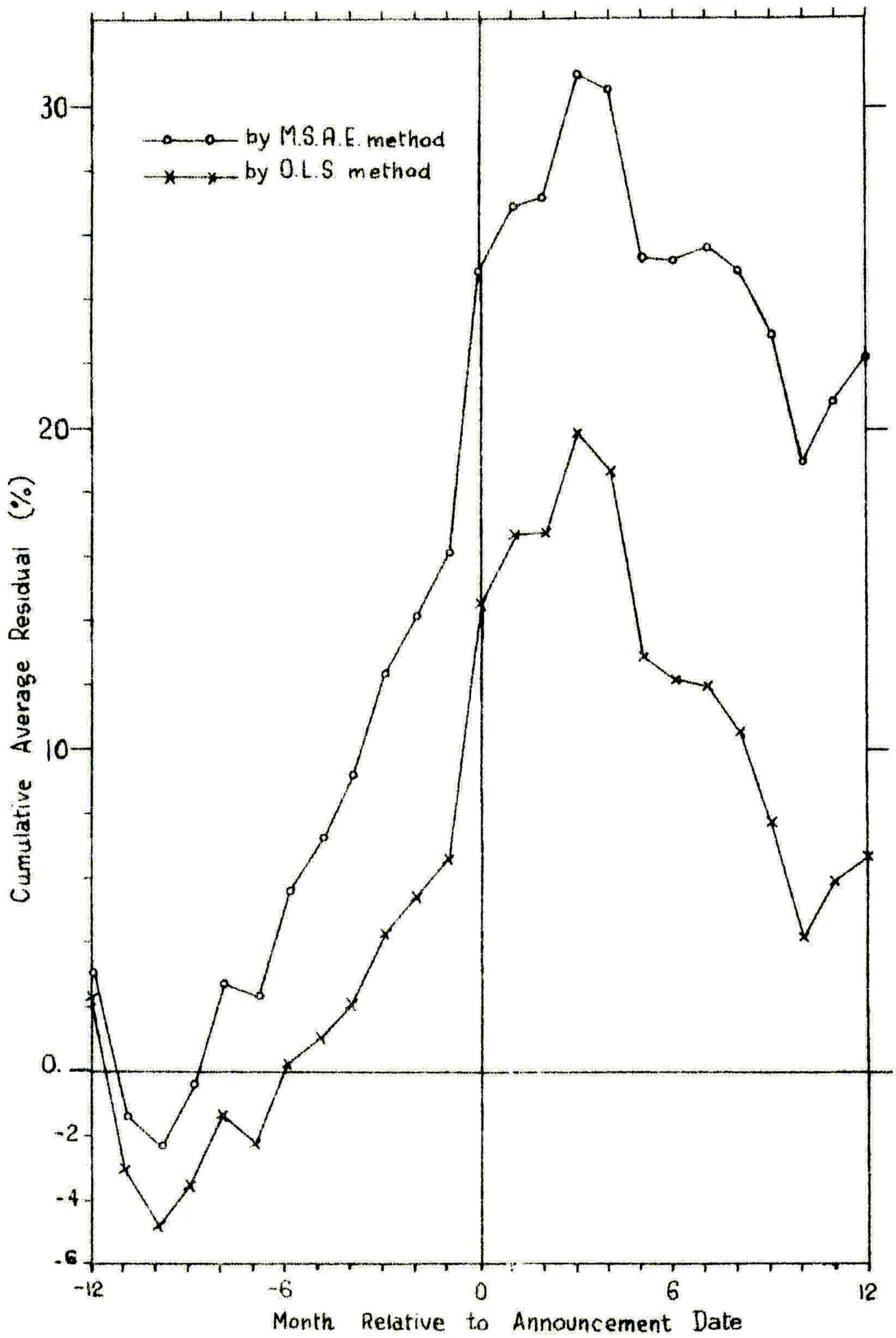

Fig. 3 - Cumulative Average Residuals for dividend "steady or decreases"

An examination of these results shows that the AR, and hence the CAR, obtained from the M.S.A.E. regression method is greater than that obtained from the O.L.S. method. However, despite this difference in levels, the patterns for the CAR's are the same for both methods. One can still recognise the jump in the CAR at month -6, the general rise in the level of the CAR before the announcement month with the biggest jump occurring at the announcement month, and the settling down of the level afterwards.

The difference in the level of the residuals is due mainly to the difference in the estimated values of the volatility b. The average M.S.A.E. estimate of b for 32 companies is 0.58, whereas the average O.L.S. estimate is 0.70. The O.L.S. would attribute more of the upward movement in prices to the effect of market-wide influences than would the M.S.A.E. method, thus leaving a smaller amount to be attributed to the effect of asset revaluation announcement. The final value of CAR by the O.L.S. method is about 10% less than that by the M.S.A.E. method.

The reason for the smaller estimate of volatility b by the M.S.A.E. method is illustrated in Figures 4 and 5. In Fig. 4, there are no extreme points and the M.S.A.E. result is very close to the O.L.S. result. In Fig. 5, however, there are at least two extreme points. If these are excluded then the M.S.A.E. estimate is very close to the O.L.S. estimate. But if these two extreme points are included, the O.L.S. estimate of b jumps towards the direction of these two points, whereas the M.S.A.E. estimate remains more consistent with the main body of the data, i.e. $b \simeq 0$. This illustrates the sensitivity of the O.L.S. method towards the extreme points. Consequently, it can be said that the O.L.S. estimate of volatility b is potentially more exaggerated than the M.S.A.E. estimate. As a result, the movement in prices due to revaluation announcement is underestimated by the O.L.S. method.

5 *Conclusions*

Despite the difference in the general level of CAR, the patterns are quite similar for both the O.L.S. and M.S.A.E. methods. This means that most of the conclusions arrived at by Sharpe and Walker regarding the efficiency of the market are still valid, viz. the market regards the announcement of asset revaluation as information of significance and tries to absorb this piece of information into its price quickly. Indeed, most of the adjustment is completed by the end of the announcement month. What

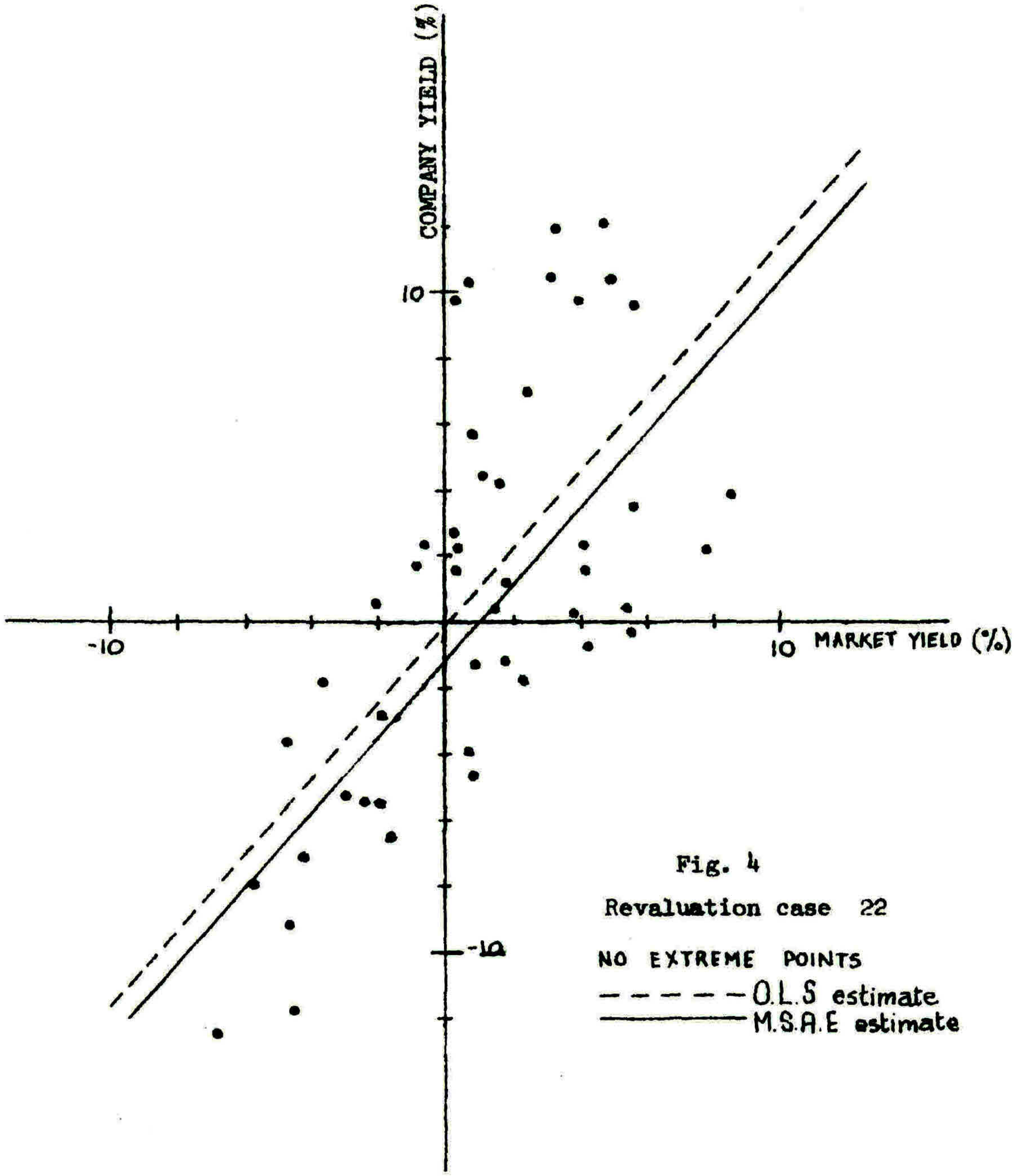

Fig. 4

Revaluation case 22

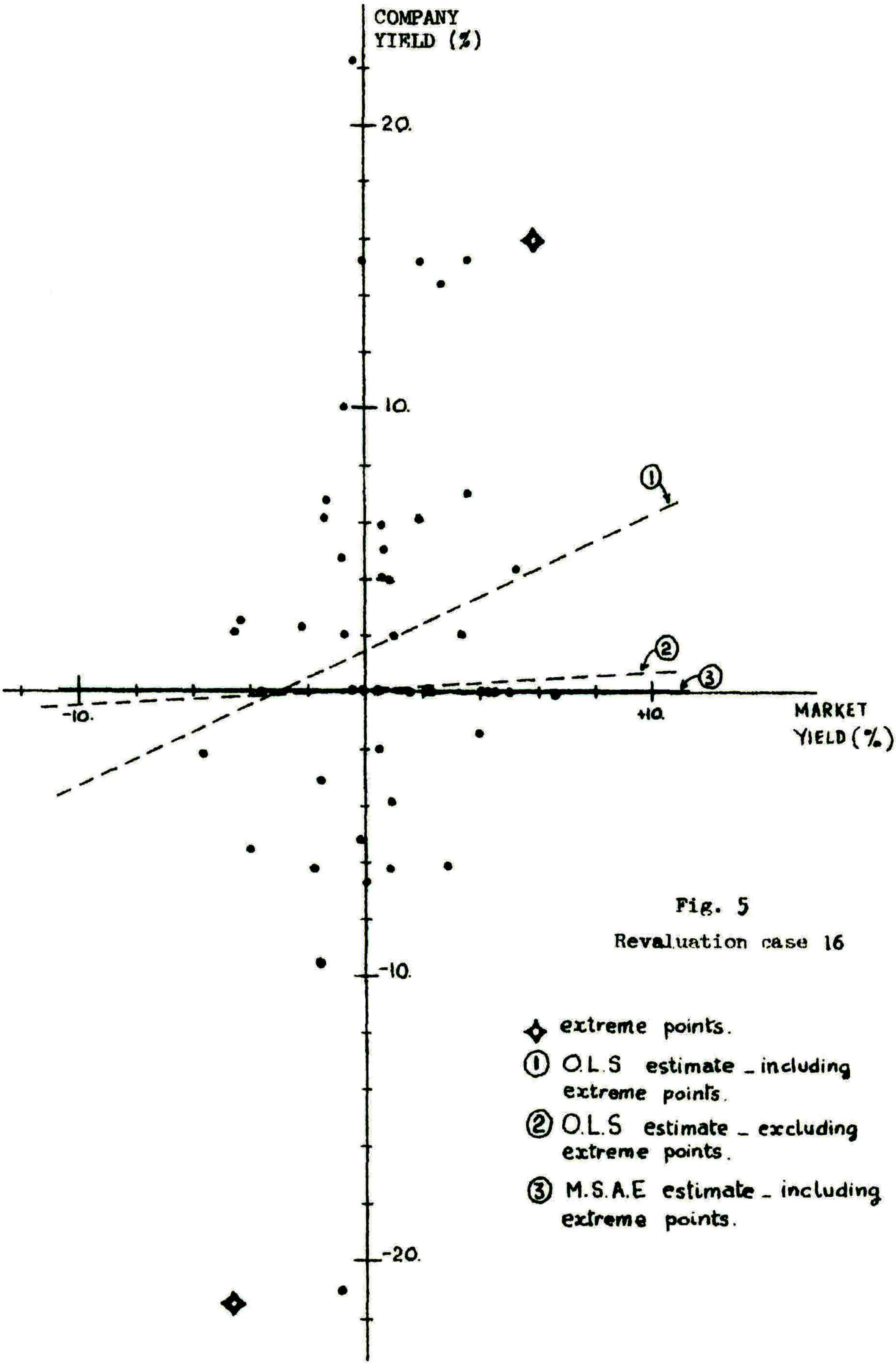

Fig. 5

Revaluation case 16

the M.S.A.E. study has added to the Sharpe and Walker study is a confirmation that this basic conclusion is not affected by the particular estimation method used, whether it be one which is heavily biased towards the extreme points (O.L.S. method) or less biased (M.S.A.E. method). The Sharpe and Walker conclusion is the property of the main body of the data and not just that of the few extreme observation points only. Had it been otherwise the two sets of results would have diverged significantly, the O.L.S. results being biased towards the direction of the extreme points and the M.S.A.E. results towards the main body of the data.

On the level of the average increase in return following a revaluation, it is difficult to say whether the O.L.S. prediction of 20% is nearer to the true figure than the M.S.A.E. prediction of about 30%. If the data is truly normal, the O.L.S. prediction will be nearer to the true figure. But if the data is highly non-normal (characteristic exponent α is much less than 2) the M.S.A.E. prediction should be considered. In reality, we expect the empirical data to be somewhere in between these two extremes, consequently, the O.L.S. and the M.S.A.E. predictions should provide useful lower and upper limits for the true results.

APPENDIX I

Stable Distributions

If X is a random variable, with density function p(x), the characteristic function if X is defined as:

$$C(\phi) \equiv E\{ e^{i\phi X}\} \qquad ; \quad i=\sqrt{-1}$$
$$= \int_{-\infty}^{\infty} p(x)\, e^{i\phi x} dx$$

That is, the characteristic function is the conjugate of the Fourier transform of the density function. Inversely, the density is the conjugate of the inverse Fourier transform of the characteristic function:

$$p(x) = \frac{1}{2\pi} \int_{-\infty}^{\infty} C(\phi) e^{-i\phi x} d\phi$$

The distribution of a random variable can be described uniquely either by its density function or its characteristic function. The Gaussian distribution, for example, is described simply by a density function:

$$p(x) = \frac{1}{\sigma\sqrt{2\pi}} \exp(-\frac{[x-\mu]^2}{2\sigma^2})$$

The Stable (or Paretian) family of distributions, however, is defined more simply by its characteristic function:

$$C(\phi) = \exp\{i\delta\phi - \gamma|\phi|^{\alpha} [1 + i\beta\frac{\phi}{|\phi|} \omega(\phi,\alpha)]\}$$

Where

$$0 < \alpha \leq 2$$
$$-1 \leq \beta \leq 1$$
$$-\infty < \delta < \infty$$
$$-\infty < \gamma < \infty$$

and

$$\omega(\phi,\alpha) = \begin{cases} \tan(\frac{\pi\alpha}{2}), & \text{if } \alpha \neq 1 \\ \frac{2}{\pi} \log|\phi|, & \text{if } \alpha = 1 \end{cases}$$

There are four parameters to describe the family of stable Paretian distributions. The parameter α is called the characteristic exponent which determines the height of, or total probability contained in the extreme tails of the distribution. If $\alpha = 2$, the distribution is normal. When $0 < \alpha < 2$, the extreme tails of the stable distribution are higher than those of the normal distribution, the higher the smaller value of α. The parameter β is an index of skewness. When $\beta > 0$ the distribution is skewed right, when $\beta < 0$, the distribution is skewed left, and when $\beta = 0$ the distribution is symmetric. The parameter δ is the location parameter. When $\alpha > 1$, δ represents the mean of the distribution. When $\alpha \leq 1$ the mean of the distribution is not defined. Finally, γ defines the scale of the distribution, for example, when $\alpha = 2$, γ is half the variance. When $\alpha < 2$, the variance is infinite, but γ remains finite to represent the scale of the distribution.

The fact that the variance of the stable distribution is infinite when $\alpha < 2$ can be illustrated as follows:

$$\text{variance} = E\{X^2\} - (E\{X\})^2$$

$$E\{X^2\} = \frac{1}{i^2} \left.\frac{d^2C(\phi)}{d\phi^2}\right|_{\phi=0}$$

but

$$\left.\frac{d^2C(\phi)}{a\phi^2}\right|_{\phi=0} = \text{terms in } |\phi|^{\alpha-1} + \text{terms in } |\phi|^{\alpha-2}$$

$$\text{if } \alpha < 2, \quad |\phi|^{\alpha-2} = \frac{1}{|\phi|^{2-\alpha}} \quad \text{is infinite when } \phi = 0$$

thus the variance is infinite when $\alpha < 2$

APPENDIX II

M.S.A.E. Regression Methods

There are many ways of arriving at the M.S.A.E. estimate of the equation

$$y_i = a + bx_i$$

The first method used in this study is the one developed by Karst [4] based on the method of steepest descent by Singleton [14]. This method, too lengthy to be described here, is capable of producing a mathematically exact estimate of a and b at the price of more iteration steps and computing time. The second method used in this study is an approximate method developed by Schlossmacher [12] which can be described briefly as follows:

Let $$S = \sum_{i=1}^{n} |u_i| \qquad (1)$$

be the objective function which one has to minimise and let $u_i(k)$ and $u_i(k+1)$ be the ith residual after the kth and (k+1)th iterations respectively. Then

$$S = \sum_{i=1}^{n} \frac{1}{|u_i(k+1)|} [u_i(k+1)]^2 \qquad (2)$$

or approximately

$$S = \sum_{i=1}^{n} \frac{1}{|u_i(k)|} [u_i(k+1)]^2$$

$$= \sum_{i=1}^{n} \omega_i . u_i^2 \qquad (3)$$

This is a weighted least squares problem, with the weights after the kth iteration being given as $\frac{1}{|u_i(k)|}$.

As we approach the final value for S, $u_i(k+1) \rightarrow u_i(k)$, thus making the objective function in (3) even closer to (1).

One of the problems of (3) is that when $u_i(k)=0$, the weight ω_i is undefined. To avoid this problem, we let $\omega_i=0$ whenever $u_i(k)=0$. This is justified in the sense that $u_i(k+1)$ will be very close to $u_i(k)$, i.e. close to zero, and hence it can be excluded temporarily from the objective function. Whenever $u_i(k+1)$ becomes non-zero again, the weight ω_i will be reintroduced.

The second problem of (3) is the question of whether the method is convergent or not. That is, will $|u_i(k+1) - u_i(k)| \to 0$, as $k \to \infty$ for all i ? Although a rigorous mathematical proof has not been found, experience in this study revealed that the method was indeed convergent in the sense that S will always approach a minimum and the estimated values of a and b will always approach their final values mostly without fluctuations, but occasionally with some mild initial fluctuations. Fig. 6 illustrates a typical example of the convergence of the Schlossmacher method, while Figs. 7 and 8 show two cases of some mild fluctuation in the value of b during the initial stages of the iterations.

Compared to other methods of M.S.A.E. regressions, including the method of linear programming, the Schlossmacher method is the most efficient in terms of computer storage and calculation time. The price however, is a little inaccuracy in the results because the final results are only approximate. Tables 2 and 3 in Appendix III show that this price is not very great. Columns (a) and (b) of Table 2 show the Schlossmacher results that correspond to the number of iteration steps shown in columns (a) and (b) of Table 3. A comparision of column (a) with column (b) shows that even when the number of iterations are cut considerably (from (a) to (b)), the results (column (b) of Table 2) are still close to the final values (Karst results).

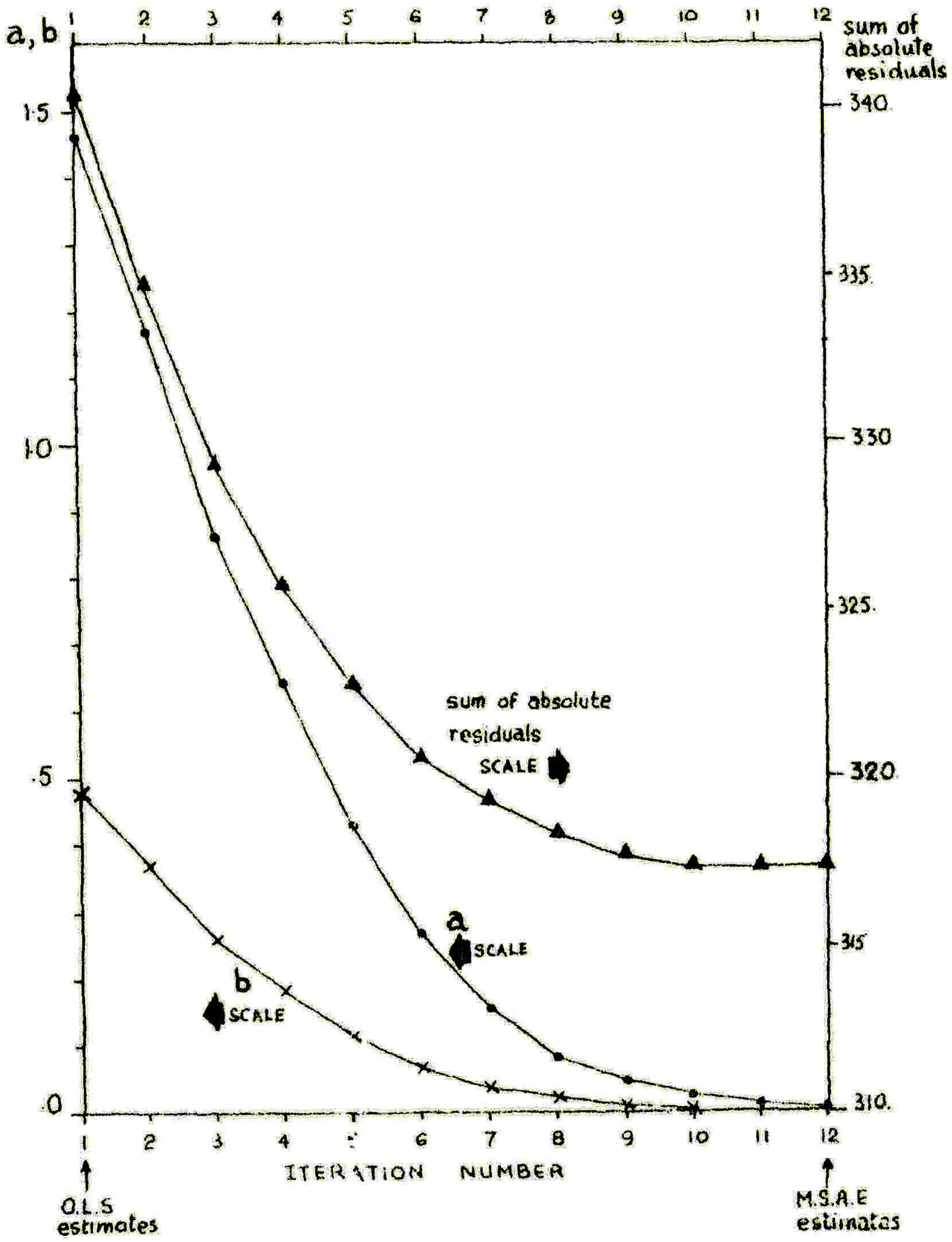

Fig. 6

Revaluation case 16

CONVERGENCE OF THE SCHLOSSMACHER METHOD

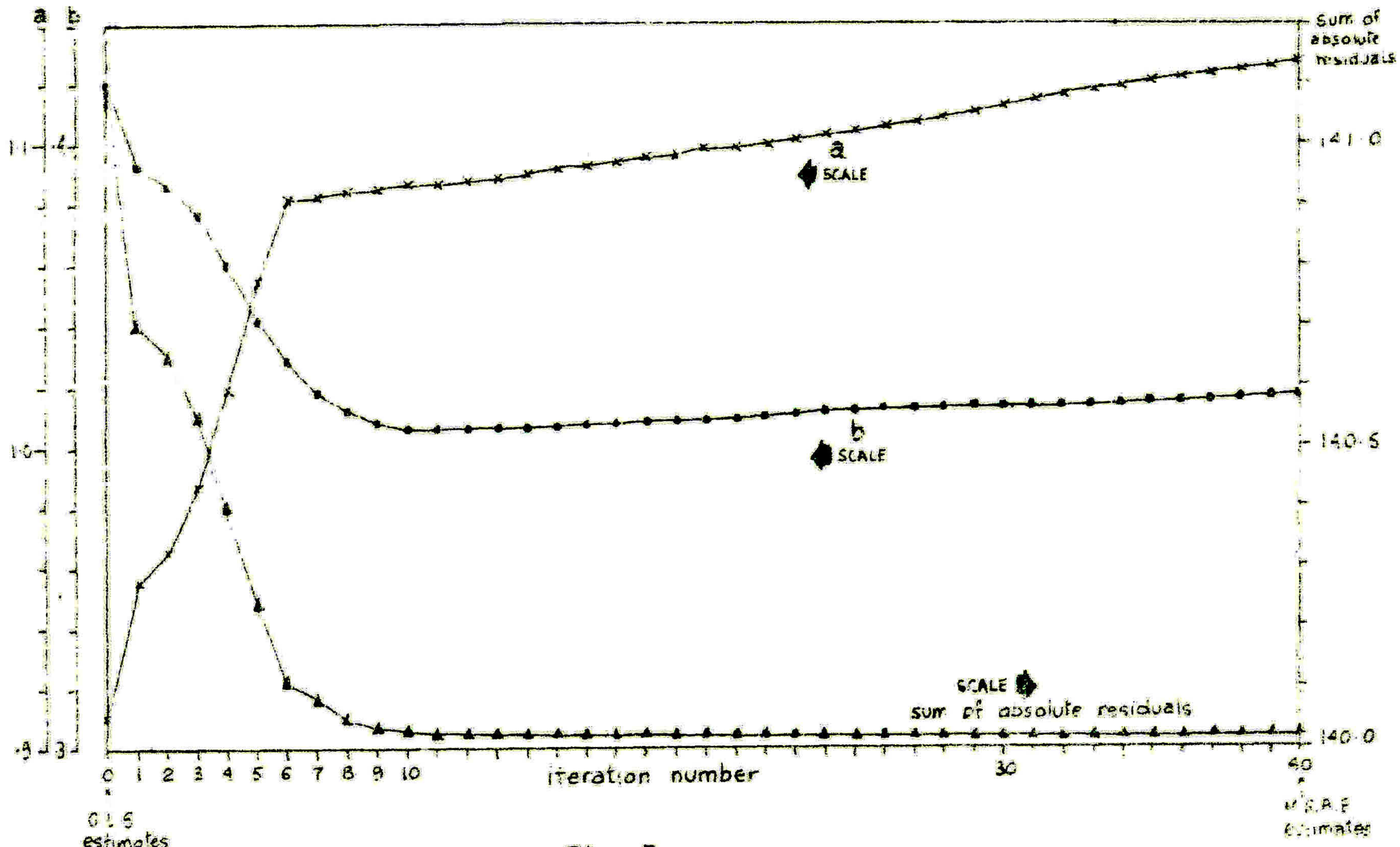

Fig. 7
Revaluation case 33

CONVERGENCE OF THE SCHLOSSMACHER METHOD

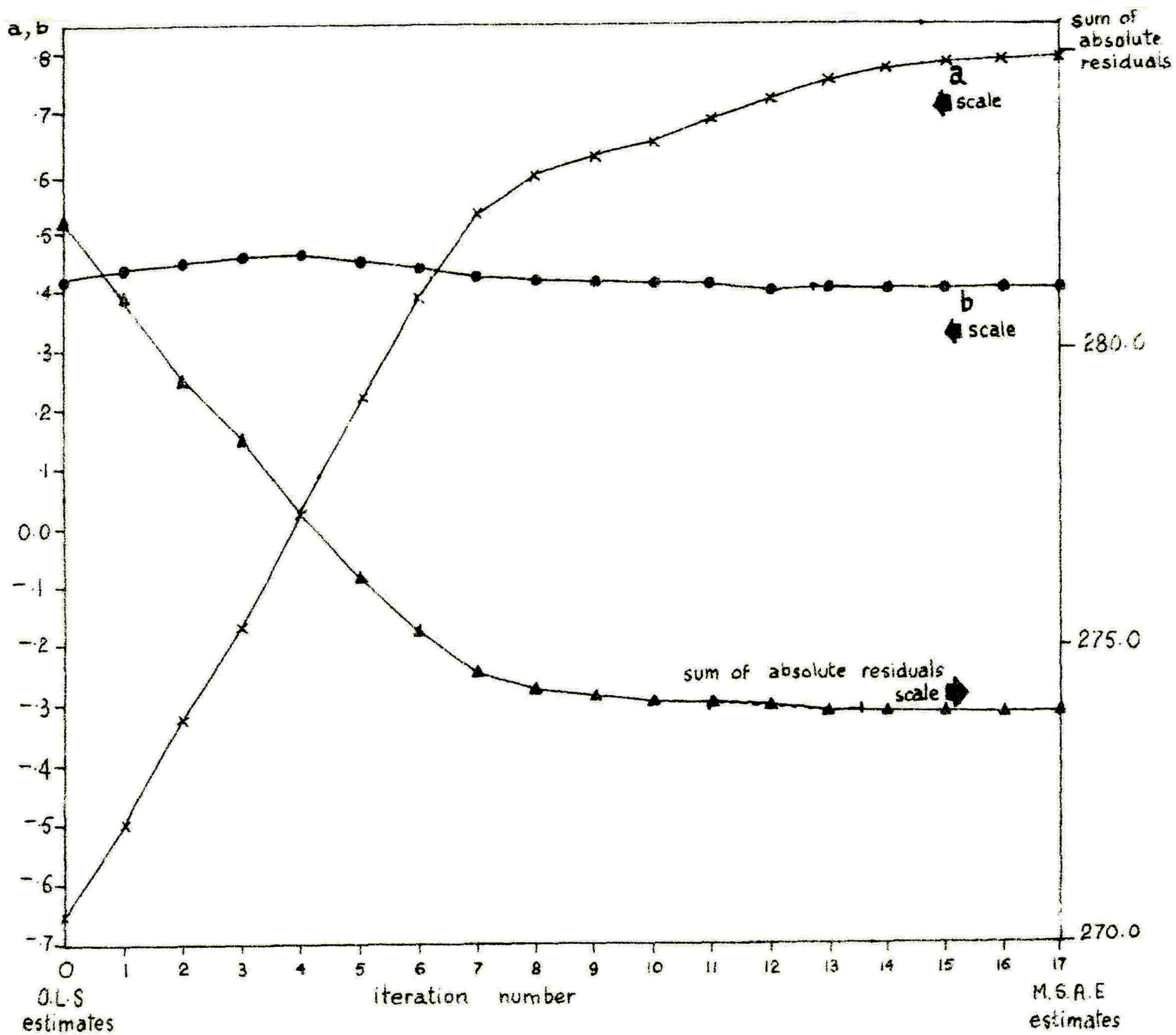

Fig. 8
Revaluation case 10
CONVERGENCE OF THE SCHLOSSMACHER METHOD

APPENDIX 111 : TABLES

TABLE 1 : LIST OF COMPANIES AND THEIR REVALUATION DATES

Revaluation Case	Company	Revaluation Date/s	Dividend
1	Elec. Equipment	8/1969	D
2	Dunlop Rubber	3/1963	I
3	G.E. Crane	9/1960	D
4	Concrete Industries	4/1960	I
5	Castlemaine Perkins	8/1960	I
6	Brickworks Ltd.	9/1961	S
7	B.H.P.	9/1960	S
8	Fairymead Sugar	8/1960	I
9	Comeng	11/1960	I
10	Broons	4/1969	I
11	Adelaide Cement	8/1961	S
12	" "	1/1969	I
13	Advertiser News	10/1963	I
14	Aust. United Investment	7/1967	I
15	Bennett & Fisher	2/1967	S
16	Wynyard Holdings	8/1963	S
17	Trustees Executors	8/1963	I
18	Howard Smith	1/1960	I
19	Qld. Cement & Lime	6/1967	I
20	Provincial Traders	5/1969	S
21	Perth Arcade	9/1967	I
22	Myer	10/1969	I
23	Mt. Isa Mines	4/1960	S
24	" "	7/1963	S
25	McPhersons	5/1961	S
26	Silvertons	10/1964	S
27	Hardie Holdings	7/1960	I
28	John Martin	10/1969	S
29	Industrial Engineering	10/1967	D
30	Mauri Bros.	10/1960	I
31	Malleys	10/1964	I
32	Aust. Paper Manuf.	1/1962	I
33	A.P.A. Holdings	10/1968	D
34	North B.H.P.	1/1960	D

NOTES : I = dividend increase
S = dividend steady
D = dividend decrease

SOURCE : Sharpe & Walker (13,p-12)

TABLE 2

ESTIMATED VALUES OF a AND b BY VARIOUS METHODS

	a				b			
			Schlossmacher				Schlossmacher	
Case	O.L.S.[1]	Karst.	(i)-	(ii)	O.L.S.[1]	Karst	(i)	(ii)
1	.474	- .092	- .078	.092	.086	.294	.290	.294
2	- .706	- .566	- .668	- .566	1.138	1.400	1.227	1.400
3	.384	- .082	- .066	-.066	.942	.615	.611	.611
4	-2.223	-2.585	-2.583	-2.585	1.476	1.571	1.568	1.570
5	.893	.942	.942	.942	.891	.691	.691	.691
6	.626	- .044	- .044	- .044	.533	.550	.556	.550
7	- .141	.054	.039	.054	.685	.499	.502	.499
8	.620	- .598	- .598	.598	.808	.984	.985	.985
9	.851	.461	.509	.463	.859	.941	.926	.941
10	- ,651	.805	.787	.787	.424	.410	.401	.401
11	.491	- .167	- .065	- .166	.650	.493	.520	.492
12	.491	- .167	- .065	- .166	.650	.493	.520	.492
13	- .131	-1.739	-1.674	-1.738	1.081	.879	.862	.879
14	- .865	- .859	- .871	- .858	.274	.344	.283	.343
15	- .605	- .455	- .456	- .456	.355	.258	.258	.258
16	1.463	0.000	.007	.001	.481	.000	.002	.000
17	.648	0.000	.007	.001	.122	.000	.001	.000
18	.467	- .647	- .630	- .630	.772	.740	.735	.736
19	- .634	.017	.017	.017	.452	.286	.286	.286
20	-1.052	.155	- .891 (*)	.158	1.087	1.081	1.119	1.080
21	.156	.206	.335	.261	.157	.044	.073	.056
22	- .178	-1.118	-1.118	-1.118	1.182	1.183	1.183	1.183
23	.120	- .260	.082	.042	.724	.702	.657	.629
24	.120	- .260	.082	.042	.724	.702	.657	.629
25	- .279	- .896	- .686	- .896	.863	.660	.754	.661
26	.359	-1.002	- .958	-1.002	.798	.489	.518	.487
27	.198	- .365	- .339	- .344	.520	.316	.322	.321
28	-1.232	-1.152	-1.015	-1.149	.905	.652	.723	.653
29	.935	0.000	.007	.001	.230	.000	.001	.000
30	.370	.134	.148	.142	1.015	.789	.822	.790
31	.569	1.201	1.209	1.201	.376	- .042	.103 (*)	-.042
32	.141	.049	.137	.051	.992	.978	.992	.978
33	.910	1.154	1.082	1.128	.412	.361	.359	.358
34	1.520	.488	.531	.496	1.008	.483	.577	.490
Av.	.109	- .205	- .203	- .209	.702	.583	.556	.581

(i),(ii),(*) :SEE NOTES IN TABLE 3

(1) All of the O.L.S. results are re-calculated. They differ slightly from the results of Sharpe and Walker because some companies have more observations included in the data of this study.

TABLE 3

CONVERGENCE OF THE SCHLOSSMACHER METHOD

Case Number	No. of iterations before Convergence	
	(i)	(ii)
1	28	23
2	21	3
3	10	9
4	8	6
5	13	12
6	11	8
7	15	11
8	21	20
9	30	20
10	17	16
11	25	7
12	25	7
13	29	12
14	22	2
15	7	7
16	15	11
17	10	7
18	16	15
19	10	9
20	27	3 (*)
21	> 40	4
22	13	13
23	15	5
24	15	5
25	37	8
26	37	27
27	28	26
28	> 40	5
29	17	14
30	16	7
31	26	7 (*)
32	23	2
33	> 40	7
34	21	9
Average	22	10

(i) Condition for convergence being : $|\alpha_{i+1} - \alpha_i| \leq 10^{-3}$

$|\beta_{i+1} - \beta_i| \leq 10^{-3}$

(ii) Condition for convergence being : $|\alpha_{i+1} - \alpha_i| \leq 10^{-2}$

$|\beta_{i+1} - \beta_i \leq 10^{-2}$

(*) Resulting in greatly different values of a and b (see Table 2)

TABLE 4

AVERAGE OF ALL 34 REVALUATION CASES

Month Relative to Announcement Date	Ordinary Least Squares Method		M.S.A.E. Method	
	Average Residual	Cumulative Av. Residual	Average Residual	Cumulative Av. Residual
-12	2.139	2.139	2.753	2.753
-11	- .603	1.536	- .052	2.701
-10	- .901	.635	- .259	2.441
- 9	.529	1.164	1.115	3.556
- 8	.992	2.156	1.561	5.117
- 7	.327	2.483	.693	5.809
- 6	3.475	5.958	4.023	9.832
- 5	.943	6.900	1.323	11.156
- 4	.728	7.629	1.218	12.374
- 3	.367	7.996	.904	13.279
- 2	1.155	9.151	1.666	14.945
- 1	2.047	11.198	2.563	17.508
0	8.642	19.840	9.144	26.652
1	1.127	20.968	1.191	27.843
2	-1.067	19.900	- .779	27.064
3	2.877	22.778	3.296	30.361
4	-1.088	21.690	- .765	29.596
5	-3.094	18.595	-2.815	26.781
6	-1.163	17.433	- .792	25.989
7	1.965	19.398	2.448	28.437
8	.359	19.757	.743	29.179
9	- .599	19.158	- .071	29.109
10	- .504	18.654	- .386	28.723
11	.974	19.628	1.134	29.857
12	.519	20.147	.973	30.831

(*) See notes (1) in Table 2

TABLE 5

AVERAGE FOR THE CASES OF DIVIDEND INCREASES

(18 Revaluations)

Month Relative to Announcement Date	Ordinary Least Squares Method (*)		M.S.A.E. Method	
	Average Residual	Cumulative Av. Residual	Average Residual	Cumulative Av. Residual
-12	2.012	2.012	2.547	2.547
-11	1.902	3.915	2.334	4.881
-10	- .197	3.718	.259	5.140
- 9	.687	4.404	1.262	6.402
- 8	- .582	3.822	- .194	6.208
- 7	1.637	5.459	1.875	8.082
- 6	3.112	8.572	3.633	11.715
- 5	1.954	10.526	2.175	13.890
- 4	.224	10.750	.459	14.350
- 3	- .140	10.609	.238	14.589
- 2	1.619	12.228	2.006	16.595
- 1	3.063	15.291	3.389	19.984
0	8.482	23.773	8.788	28.772
1	- .361	23.412	- .205	28.568
2	-1.438	21.975	-1.072	27.496
3	3.831	25.806	4.042	31.538
4	- .955	24.850	- .853	30.685
5	-1.967	22.882	-1.939	28.746
6	-2.498	20.384	-2.192	26.554
7	1.859	22.243	2.366	28.920
8	1.915	24.158	2.079	30.998
9	2.057	26.215	2.444	33.443
10	.033	26.248	.271	33.714
11	- .387	25.861	- .179	33.535
	.292	26.154	.646	34.181

(*) See note (1) in Table 2.

TABLE 6

AVERAGE FOR THE CASES OF DIVIDEND STEADY OR DECREASES

(16 Revaluations)

Month Relative to Announcement Date	Ordinary Least Squares Method (*)		M.S.A.D. Method	
	Average Residual	Cumulative Av. Residual	Average Residual	Cumulative Av. Residual
-12	2.257	2.257	3.138	3.138
-11	-5.361	-3.104	-4.569	-1.431
-10	-1.760	-4.864	- .881	-2.312
- 9	1.255	-3.609	1.962	- .350
- 8	2.210	-1.398	3.307	2.687
- 7	- .899	-2.297	- .360	2.327
- 6	2.482	.185	3.296	5.623
- 5	.825	1.009	1.576	7.199
- 4	1.106	2.115	2.013	9.212
- 3	2.166	4.281	3.043	12.255
- 2	1.077	5.358	1.842	14.097
- 1	1.226	6.584	1.969	16.066
0	7.910	14.494	8.773	24.839
1	2.121	16.615	2.064	26.902
2	0.094	16.709	.229	27.132
3	3.073	19.782	3.914	31.046
4	-1.163	18.619	- .551	30.495
5	-5.848	12.772	-5.229	25.265
6	- .682	12.089	- .061	25.204
7	- .209	11.881	.399	25.603
8	-1.389	10.492	- .681	24.922
9	-2.749	7.744	-2.072	22.850
	-3.683	4.060	-3.916	18.934
11	1.839	5.899	1.887	20.821
12	.656	6.556	1.367	22.188

(*) See note (1) in Table 2

FOOTNOTES

1 [13, p.1]

2 [13, pp.1-2]

3 [1, pp.502-504]

4 "performance" here is defined in terms of the Mean Absolute Deviation (M.A.D.) of the estimated value from the true value. That is, if B is the true value, b_i is the estimated value of B in sample i (i=1,2,...n), then the M.A.D. of this experiment is

$$\text{M.A.D.} = \sum_{i=1}^{n} \frac{|b_i - B|}{n}$$

5 Also in terms of M.A.D.

REFERENCES

[1] Blattberg, R., and T. Sargent, "Regression with non-Gaussian Stable Disturbances : Some Sampling Results", *Econometrica*, Vol.39, No.3, May 1971, pp.501-510.

[2] _____________, and J. Gonedes, "A Comparision of the Stable and Student Distributions as Statistical Models for Stock Prices", *Journal of Business*, Vol.47, April 1974, pp.244-280.

[3] Fama, E.F., "The Behaviour of Stock Market Prices", *Journal of Business*, Vol.38, January 1965, pp.34-105.

[4] Karst, O.J., "Linear Curve Fitting Using Least Deviations", *Journal of the American Statistical Association*, Vol.53, No.281, March 1958, pp.118-132.

[5] Mandelbrot, B., "The Variation of Certain Speculative Prices", *Journal of Business*, Vol.36, October 1963, pp.394-419.

[6] _____________, "The Variation of Some Other Speculative Prices", *Journal of Business*, Vol.40, October 1967, pp.393-413.

[7] Officer, R.R., "The Distribution of Stock Returns" *Journal of the American Statistical Association*, Vol.67, No.340, December 1972, pp.807-812.

[8] Osborne, D.R., "The Distribution of Price Changes on the Sydney Stock Exchange", *Economic Statistics Papers*, No.3,1971, Department of Economic Statistics, University of Sydney.

[9] ___________, "Investigation of Sydney Stock Market Prices", *Economic Statistics Papers*, No.5, 1972, Department of Economic Statistics, University of Sydney.

[10] Praetz, P.D., "Australian Share Prices and the Random Walk Hypothesis" *Australian Journal of Statistics*, Vol.11, No.3, November 1969, pp.123-139.

[11] __________, "The Distribution of Share Price Changes", *Journal of Business*, Vol.45, January 1972, pp.49-55.

[12] Schlossmacher, E.J., "An Iterative Technique for Absolute Deviations Curve Fitting", *Journal of the American Statistical Association*, Vol.68, No.344, December 1973, pp.857-859.

[13] Sharpe, I.G., and R.G. Walker, "Asset Revaluations and Stock Market Prices", *Working Papers in Economics*, No.2, 1975, Department of Economics, University of Sydney.

[14] Singleton, R.R., "A Method for Minimising the Sum of Absolute Values of Deviations", *Annals of Mathematical Statistics*, Vol.11, 1940, pp. 301-310.

WORKING PAPERS IN ECONOMICS

1	I.G. Sharpe	A Framework for Analysis of the Money Supply Process in Australia.
2	I.G. Sharpe & R.G. Walker	Asset Revaluations and Stock Market Prices.
3	N.V. Lam	Incidence and Stabilization Impact of Tin Export Taxation in West Malaysia.
4	V.B. Hall & M.L. King	Inflationary Expectations in New Zealand: A Preliminary Study.
5	A.J. Phipps	Strike Activity and Inflation in Australia.
6	N.V. Lam	Incidence of the Rice Export Premium in Thailand.
7	I.G. Sharpe	Secondary Reserve Requirements, the Monetary Base and the Money Supply in Australia.
8	Peter Saunders	Labour Demand Functions and the Quasi-Fixity Hypothesis: Some Empirical Results for U.K. Manufacturing Industries, 1963-1974.
9	W.P. Hogan	Economic Strategies for Recovery.
10	T.P. Truong	Asset Revaluations and Share Prices: A Study Using the M.S.A.E. Regression Technique.

Paper No. 5 is out of stock. Copies of the others are available upon request from:

Department of Economics,

University of Sydney,

N.S.W. 2006.