The Investment Analysts Journal

Number 10 August 1977

Die Beleggings-Navorsers Tydskrif

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Inhoud

Portfolio selection: a non-technical overview

The publication of Harry Markowitz's famous article on portfolio selection in 1952 was a major development in the history of that branch of economic thought concerned with the theory of investment. Markowitz's contribution, however, was too complex and too mathematical for the general body of portfolio managers and investment analysts in the U.S. and elsewhere so that even its simplification and presentation in book form seven years later failed to make a really significant impact on investment practice. It was not until William Sharpe further simplified Markowitz's basic theory during the 1960's and published his (Sharpe's) book on portfolio theory and capital markets in 1970, that the situation really began to change, first in the universities and later in Wall Street itself. Today it is no longer considered avant-garde to talk of betas and portfolio efficiency. Dr Kerbel's article is concerned with putting the essentials of portfolio selection to South African readers without indulging in mathematical extravagance.

Die praktyk van die kritiese rentabiliteit

The choice of an appropriate 'cost of capital' for the appraisal of investment projects is a difficult matter of judgement in capital budgeting and one that has been the subject of previous contributions to this journal. As Dr Lambrechts points out in his article in the present issue, that 'cost' is to be viewed as an imputed cost or a standard to be achieved, for which he employs the descriptive term 'kritiese rentabiliteit'. He goes on to survey actual business practice in the setting of such a minimum rate and finds that a variety of computed and even purely intuitive measures is in use.

The reverse yield gap and real return

This is the first article to appear in a new section of the journal designed to give attention to the basic concepts and practices of security investment. In the article, Richard Jesse gives attention to the reverse yield gap and explains the connection between it and such factors as risk, growth and inflation.

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The Investment Analysts Journal

Tenth issue

August 1977

The inclusion in the last issue of The Investment Analysts Journal of an article on the efficient market hypothesis has sparked off a fair degree of controversy. This is understandable. Important issues are at stake. Taken at face value the hypothesis implies that neither technical nor fundamental analysis live up to the claims of their practitioners when subjected to critical scrutiny and this threatens the very ground on which most professional portfolio management rests.

That things are no longer what they used to be was made very clear by the doyen of security analysis, Benjamin Graham, in an interview recorded last year in the U.S. Financial Analysts Journal.* Asked whether he advised careful study and selectivity amongst individual issues in selecting a portfolio of ordinary shares Graham replied:

'In general, no. I am no longer an advocate of elaborate techniques of security analysis in order to find superior value opportunities. This was a rewarding activity, say, 40 years ago, when our textbook "Graham and Dodd" was first published; but the situation has changed a good deal since then. In the old days any well-trained security analyst could do a good professional job of selecting undervalued issues through detailed studies; but in the light of the enormous amount of research now being carried on, I doubt whether in most cases such extensive efforts will generate sufficiently superior selections to justify their cost. To that very limited extent I'm on the side of the "efficient market" school of thought now generally accepted by the professors.'

Coming from a man who earned fame as an advocate of fundamental analysis, this is a surprising confession as is the opinion we quote below from the same discussion of Graham's view of Wall Street as a financial institution.

'The Stock Exchanges appear to me chiefly as a John Bunyan type of Vanity Fair, or a Falstaffian joke, that frequently degenerates into a madhouse — "a tale full of sound and fury, signifying nothing". The stock market resembles a huge laundry in which institutions take in large blocks of each other's washing — nowadays to the tune of 30 million shares a day — without true rhyme or reason.'

If this is a conclusion one comes to after a period of 60 years of informed study, something might be thought to be amiss. Are stock markets institutions which really contribute to the smooth functioning of our economy? Or do they rather resemble private clubs which exist primarily for the benefit of their members and those who, like gamblers at a casino, enjoy taking risks which really have no social significance? Do they contribute to the better allocation of scarce resources, real as well as financial? Or are they promoters of wasteful effort and confusion?

*September/October 1976

Die Beleggingsnavorsers Tydskrif

Tiende uitgawe

Augustus 1977

Die insluiting in die vorige uitgawe van Die Beleggingsnavorsers Tydskrif van 'n artikel oor die doeltreffendebeurshipotese het heelwat polemiek ontketen. Dit is verstaanbaar. Belangrike aangeleenthede is op die spel. As die hipotese woordeliks beskou word, gee dit te kenne dat nòg tegniese nòg fundamentele ontleding die aansprake van die beoefenaars daarvan gestand doen wanneer dit aan kritiese betragting onderwerp word, en dit hou 'n bedreiging in vir die grondslag self waarop die meerderheid van professionele portefeuljebestuur berus.

Die doyen van effekteontleding, Benjamin Graham, het in 'n onderhoud wat verlede jaar in die U.S. Financial Analysts' Journal* opgeneem is, dit baie duidelik gestel dat dinge heelwat verander het. Op die vraag of hy sorgvuldige studie en selektiwiteit met betrekking tot individuele uitgiftes by die keuse van 'n portefeulje van gewone aandele aanbeveel, was Graham se antwoord:

'Oor die algemeen, nee. Ek is nie meer 'n voorstander van uitvoerige effekteontledingstegnieke ten einde beter waardegeleenthede te vind nie. Omtrent 40 jaar gelede, toe ons handboek "Graham and Dodd" die eerste keer verskyn het, was dit 'n lonende bedrywigheid; maar sedertdien het die situasie aansienlik verander. In die ou dae kon enige goed opgeleide effekteontleder hom deur middel van gedetailleerde studies op professionele wyse kwyt van die selektering van onderskatte uitgiftes; maar in die lig van die geweldige hoeveelheid navorsing wat nou onderneem word, betwyfel ek dit in die meeste gevalle of dié uitvoerige pogings seleksies tot gevolg sal hê wat van soveel meer waarde is dat dit hulle koste regverdig. In dié baie beperkte mate skaar ek my aan die kant van die "doeltreffendebeurs"-denkrigting wat nou algemeen deur professore aanvaar word.'

Dit is 'n verrassende belydenis vir 'n man wat roem verwerf het as 'n voorstander van fundamentele ontleding — so ook die opinie wat ons hieronder uit dieselfde bespreking van Graham se beskouing van Wall Street as finansiële instelling aanhaal:

'Die Effektebeurse lyk vir my grotendeels na 'n John Bunyan-tipe "Vanity Fair", of 'n Falstaffse grap, wat dikwels tot 'n gekkehuis verval: "a tale full of sound and fury, signifying nothing". Die effektebeurs lyk op 'n groot wassery waar instellings groot blokke van mekaar se wasgoed inneem — deesdae niks minder as 30 miljoen aandele per dag nie — sonder werklike slot of sin.'

As dít die slotsom is wat iemand na 'n tydperk van 60 jaar se ingeligte studie bereik, is dit denkbaar dat daar iewers iets skort. Is effektebeurse instellings wat werklik bydra tot die gladde werking van ons ekonomie? Of kom hulle eerder ooreen met privaatklubs wat hoofsaaklik bestaan tot voordeel van hulle lede en diegene wat, soos dobbelaars by 'n casino, dit geniet om risiko's

*September/Oktober 1976

These are questions which need to be faced and for which we hope to provide some answers in opening our columns to the discussion of stock market efficiency. Our interest in the matter is not solely concerned with esoteric controversy.

THE EDITOR

te loop wat in werklikheid van geen sosiale belang is nie? Dra hulle by tot die beter toekenning van skaars bestaansmiddele, reëel sowel as finansieel? Of is hulle bevorderaars van verkwiste inspanning en verwarring?

Dit is vrae dié wat ons in die oë moet staar en waarop ons hoop om 'n paar antwoorde te bied deur ons blad oop te stel vir die bespreking van effektebeursdoeltreffendheid. Ons belang by die aangeleentheid gaan nie uitsluitend om esoteriese twisgeskryf nie.

DIE REDAKTEUR

Letter to the editor

Dear Sir

re: Paper by Gilbertson and Roux on JSE as an efficient market

I enjoyed reading this esoteric article in Issue No. 9 of The Investment Analysts Journal, not least because it introduced me to several new words — 'sub-martingale' (ode to a Submartingale?), 'tilde', 'lepto-kurtic' — I had not previously come across.

But come, come, gentlemen! Were your intentions and conclusions entirely serious? Can you really believe that 'the market prices of securities at any time 'fully reflect' all available information', that 'the whole field of technical analysis (is) of no value to investors', and that 'fundamental analysis . . . also cannot be expected to allow superior investment performance'? In these days of rising unemployment such views might be regarded in certain circles as downright antisocial.

The following points occur to me:

1. Market prices might always reflect all information available to the **totality of investors** but this does not mean that they have to reflect highly relevant information available to a minority, via inside information, superior analysis, etc.

   It is a matter of **common observation** that results are often announced by companies which 'surprise' the market taken as a whole and which then lead to share price adjustments. The above average analyst will not be 'surprised' by the results and will have taken earlier action.

2. It cannot be denied that clear trends in overall market movements do emerge over time, as do sectoral index trends against the market (relative sectoral strength or weakness). This surely means that 'trading rules' — if intelligently formulated and used — **can** be used to beat the market. The great thing is not to use excessively short-term trading rules. I have found mechanical trendline penetration techniques to be efficient in beating the market, provided the trends are sufficiently clearly established in time.

3. The efficient market school often claims as support for its cause that its members have never yet met anyone who has been able consistently to outperform the market. Ignoring for the moment what implications this might have for their social circumstances, this is clearly bad logic: the fact that I have personally never met a member of the efficient market school does not mean they do not exist.

4. The writers themselves concede that their first two tests — on price sequences and on trading rules — 'do not prove' the validity of the efficient market hypothesis. They must then perforce lean heavily on their third — portfolio performance tests using mutual funds. Now I contend that it is precisely here where the methodology is at its weakest:

   (a) They examine a relatively short (1973 to 1976) period of time.

   (b) They ignore the distortions arising from the mutual funds' then requirement to hold approved securities as well as other (maximum 5% holdings in any one share, etc.) provisions of the Unit Trusts Control Act.

   (c) They do not take into account the most important constraint on the fund managers: their constant vulnerability to both cash inflows and outflows. **Outflows** from the industry over the four calendar years have been as follows:

	1973	1974	1975	1976
Rm	42	30	5	8

   (d) The mutual fund industry (for which I hold no particular brief) is, in any event, most unrepresentative of the market as a whole. Transaction studies done by the JSE indicate that between, for example, August 1974 and January 1977 mutual funds accounted for between 0,7% and 3,6% of transactions measured. It is surely no good examining the behaviour of a 0%-5% segment of the market with

the purpose of drawing conclusions about the market as a whole. (Paradoxically, it would be equally meaningless to attempt to prove that managers cannot beat the market even if the industry were fully representative. If the industry **is** the market it will not be able to beat itself. The average is the average.)

I maintain that although other markets, particularly the US, may well be more 'efficient' than our own, the efficient market hypothesis is almost certainly nonsense. It is certainly not proved in the paper by Gilbertson and Roux.

R. I. K. JESSE

REPLY BY DR F. J. P. ROUX

The comments expressed by Jesse suggest that he has little knowledge of the efficient market hypothesis (EMH) and even less evidence to disprove the hypothesis.

Regarding points 1 and 2, phrases like 'a matter of common observation' and 'it cannot be denied that' have no meaning in disproving a hypothesis which has withstood rigorous statistical and empirical testing. Many who do not believe the EMH resort to such anecdotal utterances as proof of market inefficiency. If Jesse is convinced that the market is not efficient then he should prove that it isn't and publish his results. Jesse's third point is irrelevant and not worthy of comment.

As regards point 4(a), mutual fund performance was analysed over the full period during which the funds had been operating in South Africa (i.e. from 1965) as was indicated in reference 10. The authors will gladly test the performance of any other portfolios over longer periods of time if the necessary data are available. Points 4(b) and 4(c) clearly illustrate Jesse's ignorance on this subject. I suggest he reads reference 19 of our publication.

In point 4(d) Jesse indicates that the mutual fund industry may not be representative of the market. I fail to see, however, the relationship between transactions measured and total market capitalisation of the mutual fund industry. Be this as it may, Jesse's point is nonetheless irrelevant. The mutual fund industry employs analysts and chartists who continually recommend shares which they believe will have superior performance. If these portfolios cannot outperform the market there is good reason to suspect that other portfolios would also be unable to do so. Our reason for testing mutual fund performance was because the data were readily available. Data were not available for other portfolios.

Lastly, our paper did not attempt to 'prove' the EMH. It only summarised briefly the findings of three reports (references 10, 15 and 20) that had been prepared on the subject. Some of those who disbelieve the EMH have requested copies of these reports and may yet offer constructive criticism. Jesse has done neither.

10 years of improved earnings
82 years of unbroken dividends

The past year

Despite the difficult economic circumstances which prevailed during the year ended 31 March 1977

* Group turnover grew by 11% to R1 415 million
* Earnings per share increased by 4% to 21,5 cents and return on equity improved
* Earnings were derived equally from liquor and from other diversified activities
* Liquidity improved and all key financial ratios were strengthened
* Stability and resilience was demonstrated once again and dividends were maintained

The year ahead

* Higher levels of earnings are forecast for the first half of the year
* The second six months will be closely related to the economy and its possible stimulation
* The Group is well positioned to take advantage of any economic upturn

Strengths have been consolidated and the Group is well prepared to meet the challenging years ahead

SAB

The South African Breweries Limited

By C. R. Freemantle, President of The Johannesburg Stock Exchange

The history of 'securities rand' and the effects the securities rand differential has had on overseas investment in South Africa

The comments made in this article are believed to be correct and are made on the basis of experience over a number of years. They should be read as offering guidelines rather than as definite statements or interpretations of the regulations.

It must be emphasised that any queries or interpretations relating to exchange control should be made via commercial or merchant banks, who will refer such matters to the Reserve Bank if necessary.

1 HISTORY

In June 1961, stringent exchange control regulations were introduced in South Africa to stem the large outflow of capital following the event of 'Sharpeville' and ahead of South Africa's withdrawal from the Commonwealth. Our gold and foreign exchange reserves had fallen to the dangerously low level of R153 million at the end of May 1961.

As far as non-residents are concerned, the regulations have had the following main effects (which do not refer to South African emigrants):

1 Until February 1976, the proceeds of shares sold locally were blocked, and blocked rand could only be reinvested in other securities listed on The Johannesburg Stock Exchange or placed on call or deposit with an authorised bank.

2 Blocked rand could be used to subscribe for Republic of South Africa non-resident bonds. (These are non-interest bearing and tenders on a monthly basis at R85% are normally accepted. The bonds must be held by the same non-resident continuously for a period of five years to maturity when the proceeds become transferable.)

3 Blocked rand could be used to subscribe to government, municipal and public utility stocks and provided these had not less than five years to mature, the redemption proceeds were transferable to the non-resident provided he had held the stock continuously for at least five years to the date of maturity.

4 Blocked rand could be utilised to take up additional **shares** issued to a non-resident against rights which accrued on existing holdings of quoted shares, provided the new shares were of the same class and in the same company as the shares held and would rank pari passu with the existing shares.

5 Dividends and interest earned were freely transferable subject to non-resident shareholders' tax (NRST), of 15% in the case of dividends and 10% NRIT in most cases of interest. (Interest earned from government, municipal or public utility stocks is not subject to NRIT.)

Since February 1976, the authorities have distinguished between blocked rand and securities rand. The term blocked rand now refers to funds held locally by South African emigrants and such funds are subject to various restrictions. Direct transferability of securities rand between non-residents is now permitted, whereas previously non-residents had had to reinvest their blocked rand in listed securities which, following non-resident endorsement, were freely exportable for sale in an overseas market.

Items 1 to 5 above in regard to blocked rand are now applicable to securities rand.

Securities rand are traded officially on The Johannesburt Stock Exchange with bid and offered prices expressed in US cents. Broker's notes are issued in US currency.

It should also be mentioned that authorised banks will release to immigrants securities rand to the value of R20 000 on arrival without reference to the Reserve Bank but they may apply for the release of additional and larger amounts after the expiry of three years' residence. This concession has been extremely beneficial at times when the security rand differential has reflected a sizeable discount. Some immigrants have been fortunate to import their capital at a premium to them of approximately 50%.

Originally such transactions were effected in equities but later, due to cost considerations, gilts were used. Now the immigrant can arrange for the purchase of securities rand against payment of the currency of the country of his previous domicile.

For example, if an immigrant from the United Kingdom wished to transfer sufficient sterling through official banking channels to have R20 000 in South Africa, he would have to outlay £13 442 (exchange rate R1,49 to £1). However, if he were to purchase securities rand at a price of 69 US cents (40% discount) to arrive at a figure of R20 000, he would only have to spend £8 086. A 40% discount from the Johannesburg price is equivalent to a 66% premium over the overseas price. (115 ÷ 69 = 1,66 = 66%: 69 ÷ 115 = 0,60 = 40%)

2 THE EFFECT ON SHARE PRICES AND ARBITRAGE AS A RESULT OF THE INTRODUCTION OF SECURITIES RAND

As mentioned earlier, securities bought or owned by non-residents must be endorsed as 'non-resident' owned shares. 'Non-resident' endorsed securities are freely exportable and may be sold on overseas markets.

However, the immediate result of the control over capital transfers (as well as the then state of our gold and foreign exchange reserves) resulted in a differential emerging between the level of share prices ruling locally and overseas. Investment sentiment was at a low level with confidence both locally and overseas

strained. Rather than have the proceeds of the sale of shares blocked by selling in Johannesburg, non-residents preferred to sell in overseas markets and share prices in those markets fell as a result of selling pressure until supply and demand came into equilibrium.

Early arbitrage transactions were effected at differentials of approximately a 40% discount until the rate settled at about a 25% discount. A graph reflecting fluctuations in this rate is produced under Table 1. A narrowing or widening of the differential reflects the demand/supply relationship between the local and overseas markets and therefore acts as a confidence indicator. The rate should not move to a premium over the official exchange rate (say between the rand and the dollar) because payments can be made at the official rate through normal banking channels.

Today most international arbitrage is based on dollar prices compared with local prices and the following example is offered as an explanation:

Local price 100 SA cents = 115 US cents (official exchange rate $1,15 to R1)

Overseas price 92 US cents

Percentage discount: $\frac{115 - 92}{115} \times 100 = 20\%$

Based on the above example, the price of securities rand quoted on The Johannesburg Stock Exchange would normally be 91 US cents buyers, 93 US cents sellers.

Following the introduction of capital transfer controls in June 1961, arbitrage operations were effected in a rather laborious manner called four-way arbitrage. This included a purchase in London and the sale of the shares in Johannesburg, thereby creating a blocked rand credit balance at a rate of say 20%. The arbitrageur would then purchase other shares in Johannesburg (paying for the purchase with his blocked rand credit), which he would hope to sell in London at a rate of 18% in order to make a profit. Shares were merely a vehicle for creating a currency at a rate in order to use that currency at a different rate on a return transaction. While South African arbitrageurs remained in a situation where their intention was to profit from share price differences between markets, overseas arbitrageurs had to concentrate on fluctuations in the blocked rand rate.

The same situation applies for securities rand, but the overseas arbitrageur has become far more sophisticated in his risk operation. He now takes a view on a rate and will create securities rand at that rate, either by selling shares in Johannesburg or buying securities rand. His view will then be that the rate is going to narrow towards parity in order to make a profit.

INVESTMENT DOLLAR PREMIUM

The position of all non-United Kingdom overseas arbitrageurs is identical and prices of South African shares ruling in Northern America and Europe will be at similar levels expressed in US dollars, and will reflect a similar discount on Johannesburg prices.

In the United Kingdom, however, the imposition, in June 1972, of the investment dollar premium on South African securities altered the situation. A UK purchaser of South African securities must now pay for them with investment dollars purchased from the 'dollar pool'.

In London, South African securities are quoted 'cum premium' i.e. the share price includes the investment dollar premium. If the dollar premium is stripped off the price one arrives at an ex-premium price, which in the case of South African securities would be similar to the discount price quoted in other overseas markets: the difference between the ex-premium price and the Johannesburg price reflects the securities rand discount.

The initial impact of the investment dollar imposition was to widen the blocked rand rate (as it was then known) and subsequently as the demand for investment dollars increased, the blocked rand discount widened further as reflected in the Chart.

It is necessary to distinguish between the quoted investment dollar premium and the real premium. The difference between these is due to the fact that it was decided to keep the investment currency conversion rate at $2,60 to the £ and to bring into the equation the floating £ exchange rate.

The real premium is calculated as follows:

$$\text{Real premium} = \frac{X\ (100 + \$\ \text{prem})}{2{,}60} - 100$$

Where X = ruling £/$ rate

$ premium = dollar premium expressed as a percentage

The formula used to strip the dollar premium from the cum premium and convert it to a comparable Johannesburg price is as follows:

$$100\left[\left(\frac{\text{London price}}{\text{Jhb. price}}\right) \times \left(\frac{\dfrac{\text{Old £/\$ rate (i.e. 2,60)} \times 100}{\$\ \text{prem.} + 100}}{100} \times \text{Rand/\$ rate}\right)\right]$$

The second part of the equation is:

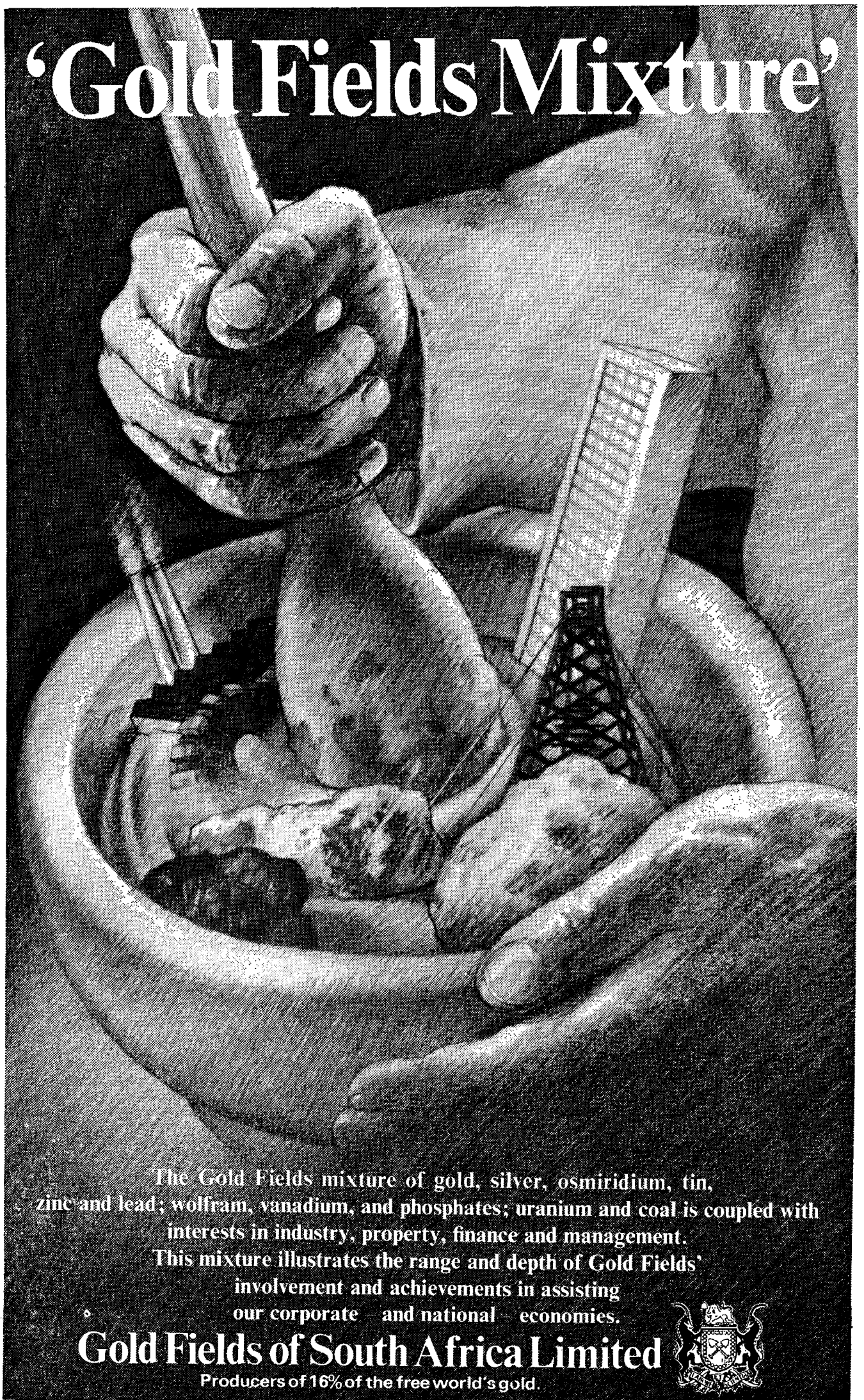
$$\frac{\text{Old £/\$ rate}}{\dfrac{\$\ \text{prem} \times 100}{100} \times \text{Rand/\$ rate}} \times 100$$

This, however, can be simplified by using the 'factor' reported by Reuters daily which gives all but the Rand/$ rate. When the Rand/$ rate is applied to the factor and the result then applied as in the original equation, the discount is obtained:

$$100 - \left[\frac{\left(\text{Conversion factor}\right)\left(\text{London price Cum premium}\right)\left(\text{Spot £/Rand rate}\right)100}{\text{Johannesburg price}}\right]$$

The following excerpts from an article in 'Lloyds Bank Review' by P. K. Woolley on 'Britain's Investment Currency Premium' are worth quoting:

'There is, in effect, a pool of foreign exchange available for use for portfolio investment abroad, the size of which is determined first by the value of overseas investment at the time of the introduction of the exchange control regulations, secondly, by the subsequent changes in the value of the securities represented in the pool, and thirdly, by subtractions from or additions to the pool by various means by the authorities.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The pool is believed to have a value of about £6 000 millions — the current market value of UK investors' holdings of foreign securities based on exchange rates in the official market.

'Over most of the past twenty-seven years UK investors have, in aggregate, wished to hold foreign securities to a value greater than that of those in the pool and as a result there has typically been a premium on investment currency. In other words, since the demand for investment currency has exceeded the supply when valued at the official exchange rate, the price of this currency has been bid up, creating a premium which is the same whatever the currency denomination of the security.

'The level of the premium at any time is the percentage by which the aggregate desired holdings of foreign securities in the portfolios of UK residents exceeds the current level of the pool when this is valued at the concurrent spot rate.'

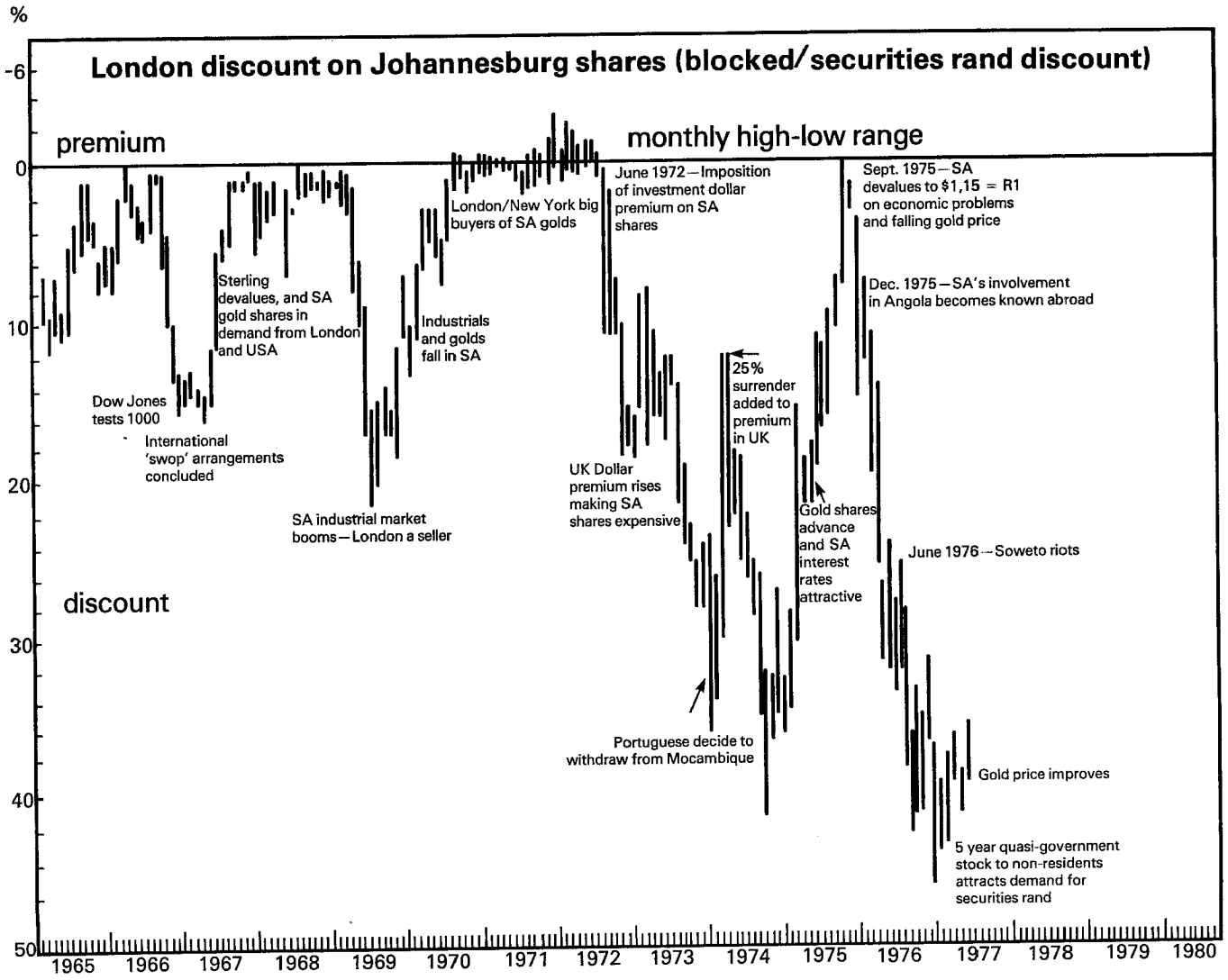
THE 25% SURRENDER VALUE RULE

What was of far more concern, and has had a most adverse effect, was the imposition of a 25% dollar premium surrender rule by the United Kingdom authorities in February 1974. This required that UK investors pay to the authorities 25% of the dollar premium proceeds of a sale of foreign securities. It is a tax on foreign investment and had the effect, as far as the dollar premium pool was concerned, of contracting the size of the pool and causing the premium to harden. The graph reflects the correlation between the rising premium and widening securities rand discount.

The major effect, however, was the increase in costs to United Kingdom investors of investing in South African securities. With a real dollar premium rate of say 40% and a £/$ rate of 1,717, the surrender would amount to approximately 10%. Taking into account the cost of dealing (brokerage and tax) of say 4%, the price of the share would have to rise by 14% to reach a break-even point.

The United Kingdom investor in foreign shares therefore has to watch not only fluctuations in the basic share price but in the dollar premium as well.

The United Kingdom arbitrageur has to watch three basics: the share price, the dollar premium rate and the securities rand rate. He, therefore, has to contend with a higher degree of risk than his South African counterpart. Analysts might find it of interest to study the performance, for example, of the RDM Industrial Index in relation to the securities rand rate.



In May 1969, when the RDM Index reached a peak, the blocked rand rate was standing at a 25% discount.

In other words, there was not the same level of confidence in London as locally that share prices were likely to remain at such high levels.

Other examples can be traced on the graph accompanying this article.

The period from June 1970 to June 1972 reflects the securities rand rate fluctuating narrowly either side of parity. Both London and New York were large buyers of gold shares while London had been a buyer of South African industrials ahead of a revival of local investment confidence.

The effect of the inclusion of SA shares in the investment dollar pool in June 1972 and the imposition of the 25% surrender rule in February 1974 are clearly reflected.

The reaction to political events such as developments in Moçambique, Angola and Rhodesia are also evident.

It is also interesting to note that the investment dollar premium rate fell between May and June 1975 as United Kingdom investors were selling South African gold shares and this increased the size of the pool despite the inhibiting effect of the pool being restricted by the 25% surrender rule tax. The subsequent increase in the rate was due to UK buying of American securities.

A final point is that the return to a non-resident investor in South African securities is of course based on the price ruling in his own market having allowed for the effect of non-resident shareholders' tax on dividend/interest income.

For example, if the local price of De Beers Deferred is 430 cents, the New York price based on a 40% discount would be 297 US cents, while the UK cum-premium price would be 242 p.

The return in each case at current exchange rates would be:

	Johannesburg	New York	London
	cents	US cents	pence
Price	430	297	242
Dividend	35	40,25	20,38
	%	%	%
Gross yield	8,14	13,55	8,42
Net yield after NRST	—	11,52	7,16

The level of the discount also has an effect on the return to a non-resident investing in government, municipal and public utility stocks where the proceeds become transferable at maturity provided the stock has been held continuously for at least five years. (Such stocks do not attract NRST.)

In considering such an investment the non-resident should be aware that the securities rand rate fluctuates and also that his yield to redemption is subject to exchange rate fluctuations as a result of devaluations/revaluations between the time of purchase and maturity.

The following examples set out the return firstly to a local investor, secondly to a non-resident investor where the securities rand discount is 20% and thirdly, where the discount is 40%.

1 e.g. 5⅛% stock 1976/1982 (local investor)

Current clean price R72,06	
Interest received over 5 years	R25,625
At redemption	100,000
	R125,625

Yield to redemption (5 years 4½ months) = 12,40% p.a.

2 e.g. 5⅛% stock 1976/1982 (20% discount)

Current clean price R72,06 =	$66,30 (securities rand at 92 US cents)
Interest received over 5 years	R25,625
At redemption	100,000
	R125,625
	= $144,46 ($1,15 = R1)

Yield to redemption (5 years 4½ months) = 17,64% p.a.

3 e.g. 5⅛% stock 1976/1982 (40% discount)

Current clean price R72,06 =	$49,72 (securities rand at 69 US cents)
Interest received over 5 years	R25,625
At redemption	100,000
	R125,625
	= $144,46 ($1,15 = R1)

Yield to redemption (5 years 4½ months) = 24,80% p.a.

The kind of insurance your future demands

By P. J. Strebel,* MBA (Columbia), PhD (Princeton)

The limited efficiency of The Johannesburg Stock Exchange

A brief, critical evaluation of the evidence for and against the Efficient Market Hypothesis on The Johannesburg Stock Exchange indicates that, at most, the hypothesis applies to half of the shares listed on the Exchange: those with average annual trading volumes in excess of at least a quarter million.

1 INTRODUCTION

Following the original exponents of the Efficient Market Hypothesis[1, 2] (EMH), Gilbertson and Roux, in their recent note[3], very ably presented the case for the efficiency of The Johannesburg Stock Exchange (JSE). Since the practical implications of the EMH are no less than revolutionary — technical and fundamental analysis become largely redundant, as investors are best advised to put their money into well diversified, market portfolios with a minimum of management fees and overhead charges, their desired level of risk being attained by appropriate gearing — it is imperative that the potential limits to the efficiency of the JSE be clearly stated.

The purpose of this note is to point out that, as far as the JSE is concerned, recently compiled evidence[4] suggests that the EMH is at best a half truth. In contrast to the larger overseas exchanges, at least half the shares on the JSE have trading volumes so low that analysis of their performance on a risk adjusted basis becomes meaningless. Moreover, with respect to high volume shares, there are some important differences between US and SA results, which suggest that the JSE case for the EMH is not yet conclusive.

In addition to reassessing the evidence reviewed by Gilbertson and Roux, reference will be made below to research carried out at the University of the Witwatersrand, Graduate School of Business Administration. The latter work falls into two categories: firstly, that performed under the supervision of the author on the performance of mutual funds and investment trusts and the impact of trading volume on risk measurement and market efficiency, and secondly, that performed under Professor Sichel on the development and testing of technical trading rules and the statistical distribution of share price relatives.

2 THE RANDOM WALK AND EFFICIENT MARKET HYPOTHESES

When interpreting the empirical data, it is important to distinguish clearly between the random walk (RWH) and efficient market (EMH) hypotheses. Rather than employ formal mathematical notation which has a tendency to confuse the distinction[5, 6] we shall restrict ourselves to a brief intuitive discussion.

The random walk hypothesis asserts that the **change** in a share's price during any period is in no way dependent on previous price changes. The degree of interdependence, or non-randomness in a time series of price changes can be assessed using the serial correlation test and analysis of runs. In addition, since random price changes are equivalent[7] to a log normal distribution of share returns, a third measure of non-random behaviour is provided by the lack of fit between the frequency distribution of share returns and the log normal distribution.

The EMH, on the other hand, merely asserts that the expected or most probable return, rather than the whole distribution of returns, is independent of previous returns and equal to the equilibrium value anticipated by the market. The implication is that in an efficient market, trading rules with abnormal expected returns do not exist (the so-called weak form of EMH). If having specified market equilibrium returns, a trading rule can be found which provides abnormal returns, the market is inefficient. Alternatively, the market is inefficient, if information (fundamental analysis for the semistrong form of the EMH, and insider information for the strong form) can be found permitting identification of returns which differ from their market equilibrium values.

While the existence of statistically determined non-random behaviour is sufficient for rejection of the RWH, more is required to demonstrate market inefficiency. It must be shown that the statistical non-randomness can be practically utilised to 'beat the market', that is, achieve returns different from market equilibrium returns. If, for example, the statistical tests indicate short-term trends or bunching of returns, it must be shown that these can be capitalised upon to obtain returns superior to the market on a risk adjusted basis.

However, the existence or otherwise of non-random behaviour is not irrelevant to tests for market efficiency. The less the non-randomness, the less the chance of finding investment strategies which yield superior returns; the greater the non-randomness, the greater the possibility of market inefficiency. It is in this sense that any evidence of non-random behaviour should be interpreted.

As emphasised by Fama[6], tests of the efficient market hypothesis presuppose a model of market equilibrium, so that any test is a joint test of efficiency and a market equilibrium model. When it is asserted that a trading rule, a particular set of information, or an investment strategy, cannot be used to obtain superior returns, the implicit assumption is that the market equilibrium model, employed to risk adjust the returns, is valid. However, the very same results, namely, the absence of evidence of superior returns, might imply an invalid market model[23], and thus, preclude any conclusion with respect to market efficiency.

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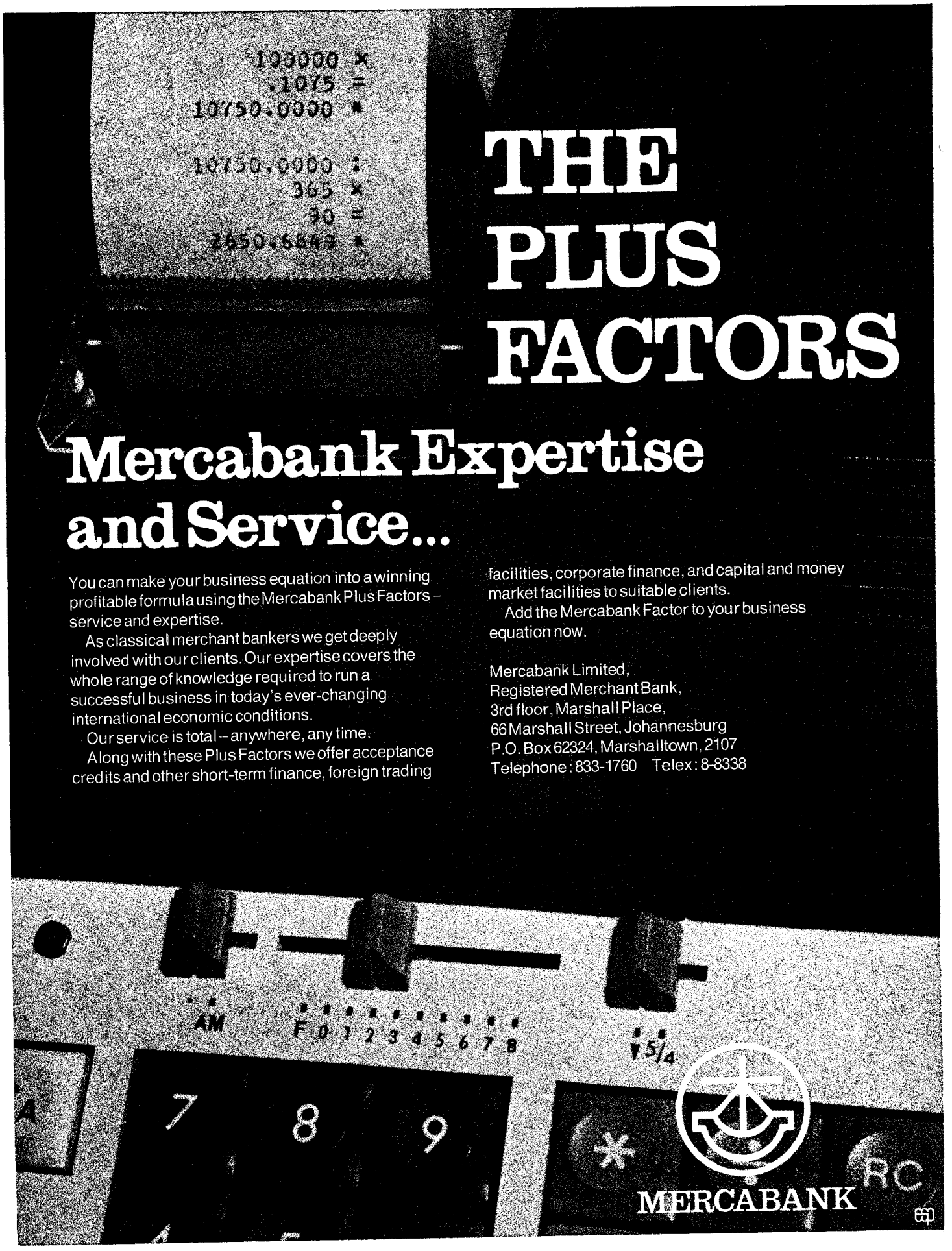
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3 FOR AND AGAINST THE JSE AS AN EFFICIENT MARKET

The state of the debate over the efficiency of the JSE is best presented in the form of a critical evaluation of the data collected using each of the tests referred to above:

(i) *Serial correlation*

The serial correlation test has been somewhat discredited since it was pointed out[5] that, unless corrections are made for non-stationarity in the data, it tends to be biased towards rejection of the RWH. Consequently, when the test is used without a variance correction, results indicating acceptance of the RWH carry more weight than those indicating rejection.

The first test of serial correlation of the JSE was published by Graves and Money[8] who concluded that the RWH is satisfied for between seventy to eighty per cent of the shares examined. However, as already noted[3], the use of weekly price data is inconclusive, because studies of other exchanges indicate that non-random behaviour tends to diminish as the correlation lag is increased from one to more days.

Both Hadassin[9] and Roux and Gilbertson[10] report evidence of dependence in price change data using the serial correlation test. While the **average** serial correlation coefficients found were small, suggesting consistency with the RWH, larger individual coefficients, with a tendency to persist as the correlation lag was increased, indicated non-random behaviour. As no corrections were made for possible non-stationarity in the data, however, these findings cannot be regarded as especially significant.

(ii) *Analysis of runs*

The number and length of runs, or unbroken sequences of positive, negative, and zero price changes can also be used to test for non-random behaviour by comparing the actual numbers of runs, in the time series of a share's price changes, with the expected numbers corresponding to random behaviour.

In contrast to the serial correlation analysis, both Hadassin[9] and Roux and Gilbertson[10] find evidence of non-random behaviour in their analyses of runs. The former reports significant dependence in the price changes of 24 out of 30 shares analysed using a differencing interval of one day and 12 out of 30 using an interval of four days. The latter report that with one, four, nine, and sixteen day price changes, 23, 22, 11, and 8 out of 24 shares, respectively, exhibit run distributions significantly different from that corresponding to random behaviour.

The significance of the results is difficult to interpret, however, because no account was taken in either study of 'false zeroes', i.e. share returns of zero corresponding to days on which no trading occurred. False zeroes, which are particularly characteristic of the thin market for many of the JSE shares, tend to reduce the length and increase the number of positive and negative runs, while increasing both the number and length of zero change runs. In section (iv) below, we discuss the results of tests which take the false zero problem into account.

(iii) *Distribution of returns*

Examining the frequency distribution of returns on shares listed on the JSE, Schlosberg[11], Roux and Gilbertson[10], and Ozen[12], all report strongly leptokurtic characteristics, that is, strongly peaked distributions with long tails. According to Roux and Gilbertson[10] the JSE distributions 'conform to a class of non-Gaussian stable distributions'. Such infinite variance, stable Paretian distributions were first suggested for share returns by Mandelbrot[13] and Fama[1]. They have since been criticised by Sharpe[14] for being restrictive and evidence[15, 16] has been presented indicating that they do not fit as well as Student - t distributions.

In addition to an unfortunate choice of theoretical distribution, Roux and Gilbertson[10] again failed to correct for false zeroes. In this case, the false zeroes result in distributions with exaggerated peaks. Excluding false zeroes, Schlosberg[11] compared the distribution fit of six highly traded JSE shares to the normal, stable Paretian, Student - t, and Compound normal models, the latter having been derived and first applied by Sichel to diamondiferous deposits[17]. In all except one case, for which no definitive conclusion was reached, the Student - t and Compound normal provided better fits than the stable Paretian.

Both the Student - t and Compound normal consist of mixtures of normal distributions with non-stationary variance; they differ in the mixing functions used to aggregate the normal distributions. It has been suggested[11] that the empirical distributions can be subdivided into subperiods of homogeneous behaviour, during which Ozen has demonstrated[12] that single distributions of either the normal or leptokurtic type provide the best fit.

In brief, over short periods of time, share price returns exhibit homogeneous behaviour, that is, they can be described by single distribution functions with a single variance. For some shares this behaviour is random and the normal distribution applies; for other shares, the behaviour is non-random and a leptokurtic distribution fits best. When aggregated over longer periods, these subperiod distributions combine to form either Student - t or Compound normal distributions. Although the existing sample of eleven correctly analysed return distributions from the JSE is too small to allow general conclusions, it does suggest a high proportion of leptokurtic and hence non-random behaviour.

(iv) *Technical trading rules*

The indications of non-random behaviour discussed above imply that the JSE **may** be inefficient. Confirmation of inefficiency, however, requires a demonstration that somehow returns can, or have been consistently obtained, superior to those from a buy and hold strategy of comparable risk.

To the author's knowledge, no technical trading rule has yet been published anywhere, which consistently outperformed a buy and hold strategy on a risk adjusted basis, after the deduction of brokerage

and managerial expenses. The four trading rules applied by Roux and Gilbertson[18] to JSE shares were consistently outperformed by a buy and hold strategy. Moreover, Roux and Gilbertson found that the signs of non-random behaviour implicit in some of the larger serial correlation coefficients (see section (i) above) could not be utilised to earn superior returns.

Obviously, any single trading rule which outperformed a buy and hold strategy would be sufficient to disprove the EMH. For example, at the University of the Witwatersrand, students[24] working under Professor Sichel at the Graduate School of Business Administration are attempting to devise a statistically based trading rule capable of capitalising on the differences in average return between subperiods of homogeneous behaviour (see section (iii) above).

Apart from the possibility that the trading rules tested so far have not been sophisticated enough to capitalise on share return behaviour which is statistically non-random, all trading rule tests are subject to the problems of interpretation implicit in joint tests. When a trading rule is said to have been outperformed by a buy and hold stretegy, some market model has been used, at least implicitly, to position the two sets of return in the same risk class. Thus, the results from trading rule tests are only as valid as the market models which underpin them. On the other hand, to the extent that the underlying market models are valid, the lack of a documented, successful trading rule on the JSE represents support for the EMH.

(v) *Portfolio performance*

Tests of portfolio performance extend the search for a superior trading rule, or investment strategy, to professionally managed portfolios, usually mutual funds or investment trusts. As already noted[3], the two initial studies on South African mutual funds by Du Plessis[19] and Kerbel[20] were undertaken when the industry was in its infancy, and therefore, were constrained by the limited amount of data available at the time.

In a more recent study of JSE mutual fund performance over the period 30 June 1973 to 30 September 1976, Gilbertson[21] concludes that no fund consistently outperformed the market or any other fund. Taylor[22] analysing both mutual funds and investment trusts over the period March 1967 to December 1976 arrives at the same conclusion. Gilbertson presents some evidence of beta (risk coefficient) stability and ranks the performance of the portfolios, whereas Taylor finds unstable betas and points out that the portfolio rankings are not statistically significant, owing to the statistical error associated with the measure of performance.

More importantly, however, both studies report that the beta coefficients are non-stationary over time. Moreover, neither was able to identify a risk-return tradeoff, that is, a statistically significant, linear relationship between the ex-post risk and return of JSE mutual funds and investment trusts. These last two results imply that the empirical validity of the capital asset pricing model (CAPM) of market equilibrium has not been demonstrated on the JSE. Hence, the absence of superior mutual fund or investment trust performance might be attributable not so much to JSE market efficiency, as to inapplicability of the CAPM, an issue about which more will be said below.

4 TRADING VOLUME LIMIT TO MARKET EFFICIENCY TESTS

In a recent paper, Saloner and Strebel[4] document the empirical impact of low trading volumes on the measurement of the beta risk coefficient of shares and portfolios. At average annual trading volumes of less than approximately 250 000, beta is volume dependent: the lower the volume, the lower beta and the stronger the relationship. The same is also true of the correlation between share and market returns. In other word, the influence of market movements on thinly traded shares is dependent on the level of the share's trading activity, so that the ex-post beta estimate of the share's market risk is determined by trading volume rather than the inherent riskiness of the share.

It is hardly surprising, therefore, that the ex-post risk-return relationship is almost non-existent for shares with low trading volume, the correlation between return and beta[4] being insignificant for a random sample of 27 poorly traded shares over the seven-year period 1970 to 1976. On the other hand, a reasonably well defined risk-return relationship, with a correlation coefficient of 0,61 significant at the 0,01 level, was found for a random sample of 23 highly traded shares over the same period.

Since some 50% of the shares listed on the JSE fall into the low volume category and since most mutual funds and investment trusts are reasonably well diversified across the market, their beta risk coefficients will also be volume dependent, even if the relationship is somewhat diluted[4]. The non-stationarity of portfolio betas and the absence of an observable risk-return relationship follows immediately, as does the inapplicability of the CAPM in tests of JSE efficiency. In brief, nothing can be said about the efficiency or otherwise of the JSE, on the basis of the portfolio performance tests carried out to date.

In the absence of a valid market model, it is impossible to test for low volume market efficiency as defined by Fama[6]. One can only investigate the impact of thin trading activity on the results of the three statistical tests, to see whether there is more non-random behaviour at low volumes, which could conceivably be capitalised upon to gain unusually high returns.

With respect to the share distributions, Ozen suggests that trading activity seems to explain the different types of distribution on the JSE. Although the sample is admittedly small, the results suggest that the lower the trading activity, the greater the chance of non-random behaviour in the form of a bunching of returns and correspondingly peaked subperiod distributions.

As pointed out earlier, the analysis of runs is distorted by the higher number of false zeroes at low trading volumes, because the false zeroes interrupt what might in fact be longer runs. To assess whether potentially profitable runs exist at low volumes, Saloner and Strebel did not exclude the false zeroes, but reclassified all the zeroes as either part of a positive or negative run, in order to preserve the cumulative rates of price change characteristic of low volume shares. Within this frame-

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work, the monthly price changes of high volume shares were consistent with random behaviour, whereas low volume shares exhibited highly significant non-random behaviour[t].

Price trends in monthly data suggest strong chances of unusual returns. In fact the 27 low volume shares in the sample of 50 analysed earned consistently higher annual average returns than the high volume shares over the seven-year period studied. Since the average number of days on which unfulfilled purchase offers were recorded was greater than the average number of days on which unfulfilled selling offers were recorded, the difference in returns between low and high volume shares cannot be ascribed to a marketability premium associated with the former. Rather, given the non-random run behaviour of low volume monthly returns plus the tendency for such shares to be tightly held, it seems that the transactions of major shareholders may affect the return on thinly traded shares, so that the competitive market assumption breaks down. In this case, neither the mean-variance market equilibrium model, nor the efficient market hypothesis can be said to apply to the JSE at low volume.

5 CONCLUSIONS

At best, the efficient market hypothesis only applies to half of the shares traded on The Johannesburg Stock Exchange: those with average annual trading volumes in excess of at least 250 000. The trading volumes of the others are so low that their market risk becomes volume dependent, the ex-post capital asset pricing model loses its validity as a framework of market equilibrium, and as a result, the usual tests of market efficiency are rendered useless. The evidence of longer runs, higher returns, and marketability, at low volumes suggests that the competitive market assumption, required for the efficient market hypothesis, breaks down.

Although there is evidence of efficiency in the high volume sector of the JSE, most of the existing studies are of marginal significance, because they do not separate out the low volume effect. Before the JSE can be regarded as efficient with respect to high volume shares, the standard tests will have to be repeated, taking due account of the effects of trading activity.

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Portfolio selection: a non-technical overview

The modern theory of portfolio selection is now a quarter of a century old and a great deal of scientific work has arisen from it. However, it remains a somewhat obscure area of knowledge for most practitioners in the field. This is probably because of its technical and mathematical character which makes it difficult to absorb for those who are not at home with mathematical approaches. All the same the subject can give many insights, even to those who will not readily comprehend its technical niceties. This article is an attempt to spell out the principles that are involved and to summarise some of the important results while eschewing mathematical exposition.

Affluence is preferable to poverty but the rich are not without their problems. Amongst other things they need to decide in what form to keep their wealth. That requires selection, in the modern world, from a bewilderingly large array of possibilities, resulting in a choice problem that is far from trivial. Neither is this a problem of the wealthy alone. Those entrusted with the stewardship of the assets of others face the same bewildering problem of choice. Readers of the 'Investment Analysts Journal' scarcely need to be reminded of this.

CHOOSING A PORTFOLIO

A range of choices immediately raises the question of what principles should be applied in selecting a portfolio of assets. Part of the problem is solved by the requirements of use. A house or motor car is very largely purchased to meet the life style needs of the purchasers without much reference to formal rules of choice. For most assets, however, the benefits of ownership are less direct and it is necessary to analyse and assess these in order to make sensible choices. Such assessments require the specification of a basis and standard of choice.

A basis which is most likely to spring to mind is that of holding the assets which will give the highest rate of return, i.e. which will in some sense be most profitable to hold. Such an approach is cognate with the general economic principle of maximisation, and offers a single and apparently unambiguous objective to be pursued by asset holders.

However, this principle cannot be applied in the most literal sense. The rate of return on different assets is frequently not known in advance. Consequently there is no way of actually seeking to attain it even though it may be reached by chance.

This can be illustrated by a simplified example. Consider an investor who faces two alternatives:

(a) He can acquire a bank deposit which will yield precisely 10% over the coming year;

(b) He can acquire ordinary shares which offer an equal chance of a return of 60% or of minus 20%.

If the ordinary shares do yield 60% the investor will have maximised his return by holding them. But if they yield minus 20% the alternative policy — holding the bank deposit — will maximise return. Since the investor does not know in advance what will actually be the yield on the shares, he has no way of choosing the alternative which will give the highest return.

The prescription that return should be maximised is useful only to those who can foretell the future. It is of no use to ordinary mortals.

EXPECTED RETURN

The reader may well protest, at this point, that this is an over-literal interpretation. What is actually meant is that probable or expected return should be maximised.

We can rapidly ascertain that the holding of shares gives an expected return of 20% $\{(\frac{1}{2} \times 60) + (\frac{1}{2} \times -20)\}$. This is higher than the 10% promised on the bank deposit and a clear choice can be made. The principle has been rendered operational.

However, it is still not clear that the principle will always give 'sensible' prescriptions. Many asset holders faced with a choice of this type would still prefer the certainty of 10% to an equal chance of a 20% loss and a 60% gain. One can certainly think of cases where it would be most unacceptable advice to tell an investor to hold all his or her wealth in a form which might easily lead to a 20% (or some higher) loss. Indeed, it would usually be unacceptable to advise any investor to hold one asset only. A 'reasonable' asset holding rule must provide for this, or else provide a convincing reason why it does not.

Does this mean that expected return in its various manifestations, and the body of financial technology which depends upon the concept, must be abandoned? Fortunately it does not. Return (in a broad sense) is a matter of great importance to asset holders. Other things being equal its maximisation will be sought. The issues to be clarified are those of the nature of those 'other things' and what is to be done when they are not equal. This is the substance of portfolio theory.

INTRODUCING RISK

In portfolio theory those 'other things' are usually described by the summary term 'risk'. Asset holders prefer higher expected returns to lower ones (rationality) and generally they also prefer less risk to more (risk aversion). In choosing assets both risk and return must be considered, and the terms of a tradeoff must be developed.

Before doing this it is necessary to define 'risk' and 'return'. In the case of return the definition is intuitively straightforward. Return is the percentage accretion with respect to an asset over a year (or other period). It is income received plus capital profits (or less capital losses) adjusted for taxes and measured as a percentage


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of assets at the start of the year. There may be practical difficulties about measuring return. This is particularly so for assets where the capital value is not established in a continuous and active market. Nonetheless, the principle is clear. (It becomes more complex in a multi-period context.)

When it comes to risk such conceptual simplicity is absent. There is no commonly accepted and measurable risk concept which may be drawn from ordinary 'commonsense', although the idea of 'risk' as an undesirable aspect of an investment is certainly one that is understandable in general terms.

Some obvious definitions of risk are:

(a) The probability that an asset will yield less than its expected return;

(b) The probability that an asset will yield a negative return (show losses);

(c) The extent to which the worst outcome contemplated falls below the expected return.

All of these are probability concepts. The definition that portfolio theory uses is that of the 'standard deviation' of return. This is a somewhat technical statistical concept. It may be thought of as a measure of the difference between the expected return and the average shortfall that is contemplated if circumstances turn out less favourably than is expected (the average 'bad' outcome expected). The definition has the advantage that it is a basic concept of statistical theory and is thus highly usable. Other measures have been tried, but by and large they do not compare with 'standard deviation' in fruitfulness, at least in the present state of knowledge.

One way of interpreting the concept is to describe it as a measure of 'unreliability' or 'variability' of return, rather than of risk. A certain return would have a zero standard deviation. Certainty is, fairly obviously, synonymous with the absence of risk.

ADJUSTING RETURN FOR RISK

The general rule of asset choice that is applied by portfolio theory is that a rational risk averse asset holder should seek to maximise expected return after adjusting it for risk. With the definitions used it turns out that this rule usually leads to the choice of a diversified portfolio of assets, which is an intuitively satisfying result.

The precise nature of the adjustments for risk that must be applied to expected return are complex. Fortunately portfolio theory generates certain results which make these more tractable than might otherwise have been the case.

A possible formalisation of the risk adjusted expected return objective might be to maximise expected return reduced by a proportion of its standard deviation. This could be spelt out as an equation.

For example:

$$\text{Objective (1)} = \bar{r} - 0{,}2\sigma \qquad (1)$$

or

$$\text{Objective (2)} = \bar{r} - 0{,}5\sigma \qquad (2)$$

where $\bar{r}$ is the expected rate of return, σ is its standard deviation, and the overall expression is that which is to be maximised.

The objective function set out in the first example may be described as moderately risk averse. The asset holder reduces his expected return by one fifth (0,2) of the risk factor (standard deviation) to determine the objective or adjusted return expected. The objective function set out in the second example may be described as highly risk averse. A much larger weight is placed on the risk factor to determine the objective.

Table 1
Risk adjusted returns (utility indices) which arise from applying objective (1) and objective (2) to the two portfolios

Asset	Bank deposit	Shares
Objective (1) (Moderate risk aversion)	10	12
Objective (2) (High risk aversion)	10	0

The asset holder who is moderately averse to risk prefers the share portfolio. Its risk adjusted expected return is higher. The second asset holder, who is highly averse to risk, prefers the bank deposit. His aversion to risk is so weighty that it wipes out the value of the high expected return.

PORTFOLIO DIFFERENCES

It is most important to note that, by introducing the concept of risk adjustment, it has emerged that different asset holders may seek to hold different portfolios, even though they are all rational and risk averse. However, it has not yet been seen how individual sset holders may decide to hold mixed portfolios (i.e. consisting of more than one type of asset) and how they would carry out such mixing.

In order to demonstrate how this might happen it will be convenient to expand the example to the case where the asset holder faces three alternatives. The first two will be the same as those set out earlier. The third will be a holding of shares which, like the others, offer an equal chance of a 60% gain and a 20% loss. However, these chances are independent of those affecting the other shares. The fact that one share yields 60% or minus 20% will be unrelated to whether the other yields 60% or minus 20%. It will also be assumed that the asset holder can hold mixed portfolios, consisting of different proportions of the three assets. Table 2 then sets out a few of the possible alternatives and their implications in terms of various outcomes, expected returns, standard deviations of expected return, and the utility indices that emerge in terms of objective (1) and objective (2).

The portfolios are illustrated in Figure 1, where their risk/return characteristics are shown graphically. The figure also indicates, by way of arrows, the directions of preference of a rational risk averse asset holder in these respects.

The first three portfolios listed (I, II and III) are single asset holdings. The others are made up of combinations of those three basic components. Portfolio V, for example, is made up of equal proportions of Portfolios II and III. It has the same expected return as its components, but its risk is lower. Thus the combined portfolio will be preferred to its component portfolios by all rational risk averse asset holders.

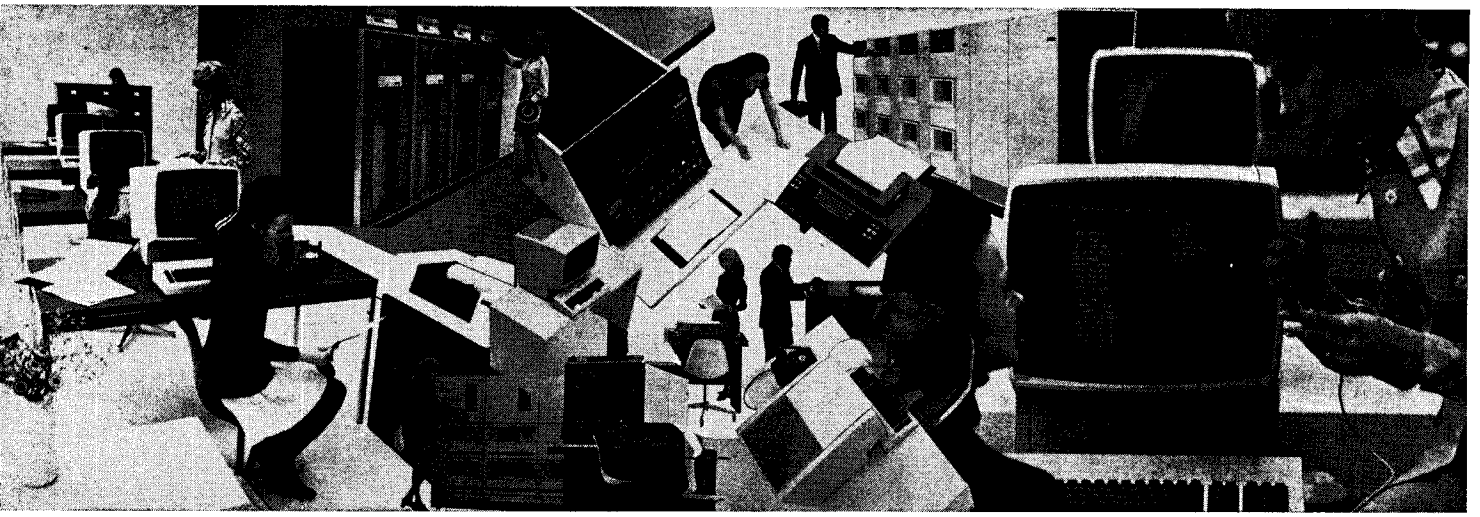

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Figure 1

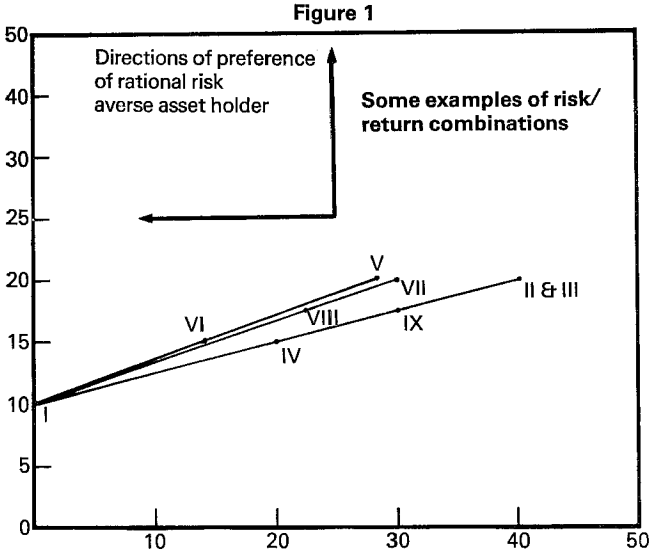
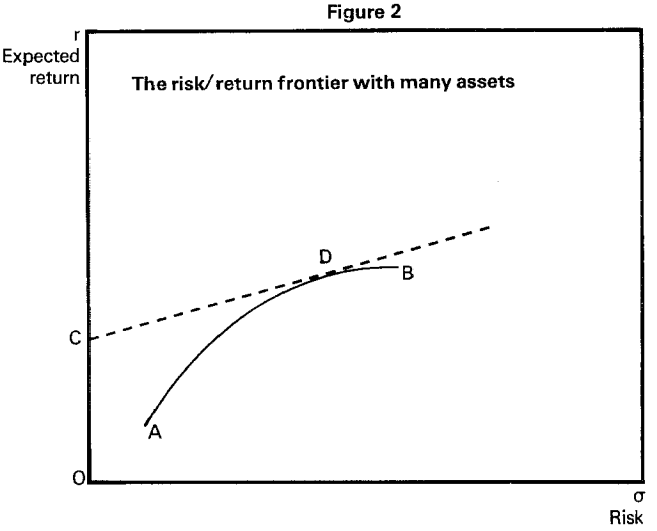


Figure 2



Portfolio IV is made up of equal proportions of Portfolios I and II. In this case both expected return and standard deviation are the arithmetic means (simple averages) of those applying to the component parts.

Portfolios V, VII, VIII and IX are made up of different combinations of the three basic assets. Portfolio VI is in effect a 50/50 combination of Portfolios I and V. Portfolio VII is a non-equal combination of the same two components as make up Portfolio V (which is preferable). Portfolio VIII is a combination of Portfolios I and VII.

Of interest is the fact, illustrated in Figure 1, that several groups of the portfolios listed lie on a single ray from the return axis, at the point where Portfolio I is represented. This makes elucidation a little easier, and facilitates the choice process.

Consider Portfolios I, V, and VIII. The ordering of their expected return/risk characteristic is such that any one of them might be most preferred by some rational risk averse asset holder. Between any two of them higher return is purchased only at the cost of higher risk to be borne. Thus, at first sight, all are acceptable portfolios on some assumption about the tastes of the asset holder. As Table 2 shows, Portfolio V is preferred to all others by the moderately risk averse asset holder with objective (1), and he would prefer Portfolio VIII to Portfolio I. Yet the highly risk averse asset holder with objective (2) gives his first preference to Portfolio I, and his last preference to Portfolio V. It certainly seems plausible to postulate that some other asset holder, perhaps one who had an intermediate amount of risk aversion, might prefer Portfolio VIII to either of the other two.

However, it can be shown that such an asset holder would still not choose Portfolio VIII. Instead he would choose a combination of Portfolios I and V.

HOME-MADE PORTFOLIOS

Consider an example of such a 'home-made' portfolio. Let this Portfolio X (not shown) consist of 76% Portfolio V and 24% Portfolio I. It would then have an expected return of 17,6% and a standard deviation of about 21,5% which makes it clearly preferable to Portfolio VIII. Its return is higher and its risk is lower. Thus such a 'home-made' portfolio would be preferred to Portfolio VIII by any rational risk averse asset holder.

It is of some importance to note that the return and risk applicable to Portfolio X is given by the weighted arithmetic means of those applicable to its component parts. In the case of return this relationship always holds. In the case of standard deviation of return, however, it only holds in the case where one of the two components has a zero standard deviation. In general the standard deviation of a composite portfolio will be less than the weighted arithmetic mean of those of its component parts (as in the case of Portfolio VI). It is this fact which justifies diversification and it is a most important principle of portfolio theory.

In the examples given the line joining Portfolios I and V represents the locus of optimal combinations. Portfolios made up of those two components dominate (are preferred to) all others that can be made up from the basic set of assets available. In effect all rational risk averse asset holders will choose portfolios that consist of a combination of the bank deposit (Portfolio I) and equal holdings of the two shares (Portfolio V).

This principle, in an expanded form, is an important result of portfolio theory. It has the effect of reducing substantially the range of portfolios which asset holders need to consider in making their choices.

THE SEPARATION THEOREM

To derive the expanded form of this principle, which is known as the 'separation theorem' it is necessary to treat portfolio theory in somewhat more depth than has been done thus far. The approach will still be fairly general, however.

Two points should be noted. The first is that the number of assets to be considered by asset holders in the real world is actually very large indeed. The second is that returns from risky assets are not, generally speaking, strictly independent. Consequently the variance (and, thus, the standard deviation) of expected return on a portfolio of assets depends not only on the variances of the individual components and their proportions but also on the covariances (association) of return between the various component assets. This has to be calculated by a formula which is somewhat complex in its structure though not inherently difficult. That formula requires, however, a rather large amount of information as input.

If a portfolio is to be selected from among 50 assets, for example, there are 2 550 variances and covariances to be considered (as well as 50 rates of return).

Then, when the assets being considered are the shares of large quoted companies this is a great deal of information and much of it is of a kind which is not readily available, and is not readily interpretable into everyday concepts. In the practical application of portfolio theory such information is frequently generated in a mechanical way from historic data. In addition, certain 'short cuts' have been developed to facilitate the analysis of such data.

Figure 2 shows the general shape of the risk/return frontier that will rule. No combinations will lie above and to the left of the line A B, which slopes upwards at a diminishing rate (or at least at a non-increasing rate). Consequently it is only the characteristics of frontier portfolios that need be calculated. And it can be shown that the frontier portfolios can be devised from the characteristics of a limited number of points along it. The computational problem is by no means as great as first appeared. Indeed, with a modern electronic computer, the computation is a matter of seconds even for fairly large populations of assets.

It can be simplified even more, in most cases. It will be recalled that in the example used earlier it was pointed out that a portfolio can be treated as a combination of other portfolios. It was also stated that where portfolios consist of one security which offers a zero standard deviation and another which has some risk, the risk/return characteristics of such portfolios can be given by a straightforward line on a graph such as in Figure 1 or Figure 2. That continues to be the case in the more general situation which is now being considered.

Consequently, as asset holder who faces the opportunity set given by the frontier A B in Figure 2, and also has the opportunity to hold a risk-free asset illustrated by point C, actually has an opportunity set of the share C D B. The existence of asset C has expanded his opportunity set, possibly to a substantial extent. For a wide range of asset holders, the most preferred portfolios will consist of the same two components. One of these will be the risk-free asset C. The other will be a holding of risk portfolio D. Some (the very risk averse) will hold a very high proportion in form C. Others will follow different policies. But the same components will make up all their portfolios. The speculator will not hold different shares from the cautious widow. He will merely hold a larger proportion of his portfolio in those shares.

SOME QUALIFICATIONS

There are, however, two qualifications to this result. The first is that it depends on the assumption that the opportunity set (in terms of risk/return possibilities) is the same for all asset holders. That may not be the case.

Asset holders in different countries for example, face genuinely different opportunity sets. Even within the same economy differences in effective factors such as: the scale of assets, knowledge, and above all, tax liabilities may result in differences in the set of opportunities available to different asset holders. In addition, different asset holders facing the same objective opportunity set, with similar personal situations, may nonetheless have different assessments of those opportunities. If one individual believes firmly that a doubling of the copper price is imminent while another believes with equal firmness that a halving is imminent, their portfolios are likely to reflect these differing assessments in the form of differing proportions of copper shares held in their portfolios.

The other qualification is somewhat different in character. In fact it arises from a body of thought which largely discounts the significance of the first qualification. The bottom line of that qualification is that the curve A B is likely, over most of its length, to be virtually flat; for all practical purposes it will coincide with the tangent C D. Consequently, a wide range of risk portfolios will be virtually equivalent from the point of view of asset holders. Thus, different holders may quite reasonably hold materially different portfolios although their risk return characteristics will be such that the differences are more apparent than substantive.

The reason for this situation, it is argued, is that the interaction of asset holders in the capital market will bring into being a price structure for different assets which will ensure that a wide range of portfolios are substitutes for what may be called 'the market portfolio' — that portfolio which is made up of all available assets.

A BIT ABOUT BETA

A by-product of this theoretical approach is the enigmatic beta coefficient which is the best known manifestation of portfolio theory among financial practitioners.

The beta coefficient is a measure of the responsiveness of the probable return on a given asset to variation in the return on the market portfolio. Any reasonably well spread portfolio with an average beta of one will be a good surrogate for the market portfolio, or so the theory indicates. Thus, the portfolio manager is able to work with yet less information; he needs only the expected returns and betas of his potential assets. And he can process it in a fairly simple manner in order to generate an efficient portfolio.

The conclusion that every risk portfolio will have the same composition has the somewhat disconcerting implication that all asset holders will hold a portfolio containing all risk assets. This is because the result does not allow for any asset to be held only by a few people.

However, while the calculation of beta is easier than that of covariances it still may be a major task. And the procedures that have been used to estimate beta values have not shown these to have as much stability as theory would require if they were to be very useful. In addition the implication that you cannot really beat the market, or at any rate that you cannot do it consistently, is unattractive to those who trade on the stock exchange and other markets where the prices are patently volatile. Such individuals and institutions often depend to a substantial extent on a clientele which seeks rapid and spectacular profits. The fact that some people do indeed make spectacular profits reinforces this approach although it is probable that such spectacular profits represent luck or special situations which are not susceptible to analysis and which are balanced by many failures, some of them equally spectacular, and many which are disastrous to the individual concerned.

Portfolio theory and its developments remain the best worked out logical approach to asset selection that is known. This is illustrated by the very fact that the approach invented by Markowitz has sole claim to this appellation. Nonetheless, in the quarter century since Markowitz's first article appeared, the approach has not gained acceptance in the financial community and it does not show many signs of doing so. The reasons are no doubt complex and have partly to do with the preference of clients for the speculative and spectacular, and partly with the fact that the most widely used approaches demand less intellectual and physical effort.

Table 2
The alternatives facing asset holders with three basic investment opportunities open to them

Portfolio		I	II	III	IV	V	VI	VII	VIII	IX
	A	1	0	0	$\frac{1}{2}$	0	$\frac{1}{2}$	0	$\frac{1}{4}$	$\frac{1}{4}$
Composition in terms of assets	B	0	1	0	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{2}{3}$	$\frac{1}{2}$	$\frac{3}{4}$
	C	0	0	1	0	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{3}$	$\frac{1}{4}$	0
There is a 25%	25%	10	−20	−20	−5	−20	−5	−20	$-12\frac{1}{2}$	$-12\frac{1}{2}$
probability that each	25%	10	−20	−20	−5	20	15	$6\frac{2}{3}$	$7\frac{1}{2}$	$-12\frac{1}{2}$
of the listed rates	25%	10	60	60	35	20	15	$33\frac{1}{3}$	$27\frac{1}{2}$	$47\frac{1}{2}$
of return C% will materialise	25%	10	60	60	35	60	35	60	$47\frac{1}{2}$	$47\frac{1}{2}$
Expected return (%)		10	20	20	15	20	15	20	$17\frac{1}{2}$	$17\frac{1}{2}$
Standard deviation of expected return (%)		0	40	40	20	28,3	14,1	29,8	22,4	30
Utility index in terms of Objective (1) (Moderate risk aversion)		10	12	12	11	*14,3	12,2	14,0	13,0	11,5
Utility index in terms of Objective (2) (High risk aversion)		*10	0	0	5	5,8	8,0	5,1	6,3	2,5

*Indicates portfolio that maximises objective function.

Deur I. J. Lambrechts, BCom, BCom (Hons), MBA, DCom (Stellenbosch)

Die praktyk van die kritiese rentabiliteit

1 INLEIDING

Die kritiese rentabiliteit vervul hoofsaaklik die funksie van 'n finansiële kriterium waarmee die verwagte rentabiliteit van 'n investeringsprojek vergelyk word om sodoende die finansiële aanvaarbaarheid al dan nie daarvan te bepaal. Die problematiek van die kritiese rentabiliteit is seker die gebied in die finansiële bestuur waaroor die meeste onsekerheid bestaan. Hierdie onsekerheid handel hoofsaaklik oor die bepaling van die spesifieke omvang daarvan, dit wil sê die toekenning van 'n kwantitatiewe waarde aan die kritiese rentabiliteit. As gevolg van hierdie onsekerheid bestaan daar dan ook 'n aantal uiteenlopende menings oor die berekeningswyse en die bepalende faktore daarvan.

'n Benaming wat veral in die Amerikaanse literatuur vir die kritiese rentabiliteit voorkom, is die koste van kapitaal.[1] Hierdie benaming kan egter verwarring skep omdat koste 'n begrip is wat gebruik word vir doelmatige offers (dit wil sê ekonomies onvermybaar). As sulks kan dan moontlik veronderstel word dat die kritiese rentabiliteit in so 'n geval gelyk is aan die koste van vreemde kapitaal omdat daar in die geval van eie kapitaal nie sprake is van 'n juridiese verpligting om vergoeding op kapitaal te betaal nie (daar is egter wel 'n morele verpligting).

Die kritiese rentabiliteit verteenwoordig nie 'n koste in die rekeningkundige sin nie. Dit dien hoofsaaklik as 'n finansiële kriterium by die beoordeling van investeringsprojekte. Dit is dus daardie rentabiliteit wat 'n onderneming redelikerwys moet betaal en/of terughou vir die verskaffers van fondse. In die geval van gewone aandele en reserwes is daar geen kontraktuele verpligting om vergoeding te betaal nie. Daar moet egter redelikerwys 'n vergoeding vir die houers van gewone aandele betaal word en 'n gedeelte kan teruggehou word. Dit kom omdat gewone aandeelhouers die eienaars van 'n onderneming is. Indien die betalings en/of teruginvesterings met betrekking tot gewone aandele en reserwes nie aanvaarbaar is nie, verlaag die waarskynlikheid van 'n suksesvolle toekomstige beroep op aandeelhouers aansienlik.

Enige investeringsvoorstel wat fondse verg, kan die netto teenswoordige waarde van 'n onderneming verhoog en die voorstel moet aanvaar word, altans voorlopig, wanneer die netto teenswoordige waarde teen die kritiese rentabiliteit positief is of wanneer die interne rentabiliteit hoër is as die kritiese rentabiliteit. Die korrektheid van beide hierdie finansiële seleksiemaatstawwe is in 'n groot mate op die korrektheid van die kritiese rentabiliteit gebaseer. Die kritiese rentabiliteit is dus die skakel tussen die finansierings- en investeringsbeleid van 'n onderneming.

Die doel van hierdie artikel is om die metodes toegepas in die praktyk om die kritiese rentabiliteit te bepaal van naderby te beskou. Die resultate hierin vervat, is belangrik uit die oogpunt van finansiële instellings (kapitaalverskaffers) omdat dit 'n aanduiding gee van wat ondernemings op geïnvesteerde fondse wil verdien. Die praktiese aspekte is gebaseer op inligting wat met behulp van 'n vooraf getoetste vraeboog tydens persoonlike besoeke aan ondernemings ingewin is.[2] Die studieveld is beperk tot die sekondêre en tersiêre sektore van die ekonomie en meer spesifiek tot die 100 grootste (in terme van totale bates) genoteerde nywerheids- en handelsondernemings in Suid-Afrika (die totale bates van die kleinste van hierdie ondernemings was ongeveer R19 miljoen tydens die ondersoek). Samewerking is van 48 ondernemings verkry waarvan 38 vervaardigingsondernemings is. Vir die doeleindes van hierdie artikel word slegs na die praktyk van die vervaardigingsondernemings verwys.

2 BEVINDINGS

2.1 Benamings en die omvang van die kritiese rentabiliteit

Die benamings wat die meeste voorkom by die meewerkende ondernemings om die laagste rentabiliteit waarteen nuwe projekte aanvaar sal word aan te dui, is die vereiste rentabiliteit en die minimum aanvaarbare rentabiliteit. Eersgenoemde word deur 42 persent en laasgenoemde deur 32 persent van die meewerkende ondernemings gebruik. Die benaming afsnykoers ('cut-off rate') word deur 16 persent van die meewerkende ondernemings gebruik terwyl die benamings finansiële standaard en kritiese rentabiliteit slegs uitsonderlik voorkom. Koste van kapitaal word slegs deur ondernemings wat die geweegde benadering toepas, gebruik, maar nie alle ondernemings wat die geweegde benadering gebruik, noem dit die koste van kapitaal nie. Die omvang van die kritiese rentabiliteit by die 38 meewerkende ondernemings verskyn in tabel 1.

Tabel 1
Die omvang van die kritiese rentabiliteit by die meewerkende ondernemings

Omvang van die kritiese rentabiliteit	Getal	%
10-15% na belasting	17	44,7
15-20% na belasting	16	42,1
8-12% na belasting op omset	1	2,6
Geen formele norm	2	5,3
Wil nie inligting beskikbaar stel nie	2	5,3
Totaal	38	100

1 Ander benamings wat in die literatuur voorkom, is 'cut-off or hurdle rate', vereiste rentabiliteit, minimum vereiste rentabiliteit, 'rejection rate', kalkulasiekoers en finansiële standaard.

2 Gebaseer op Lambrechts, I. J.: 'Kapitaalinvesteringsmetodes: Teorie en Praktyk soos toegepas deur 'n aantal vooraanstaande Suid-Afrikaanse ondernemings.' Ongepubliseerde proefskrif, Universiteit van Stellenbosch, 1974. Hierdie navorsing is met finansiële bystand van die Raad vir Geesteswetenskaplike Navorsing onderneem.

Hieruit blyk dit dat die kritiese rentabiliteit tussen 10 persent en 20 persent na belasting varieer op totale netto kapitaal (totale kapitaal minus krediteure). In gevalle waar kritiese rentabiliteite in die vorm van beherende rentabiliteite verskaf is, is dit omgewerk na ondernemingsrentabiliteit. So is rentabiliteite voor belasting ook omgewerk na rentabiliteite na belasting. Die 10-persent-verskil tussen die minimum en maksimum kritiese rentabiliteit word slegs in twee groepe verdeel omdat die meeste ondernemings nie absolute kritiese rentabiliteite het nie, maar sekere grense afhangende van risiko. In sommige gevalle is die verskil in die grense groter as in ander gevalle. In die meeste gevalle is die onderste grens die kritiese rentabiliteit onder normale risikotoestande en die boonste grens die kritiese rentabiliteit by hoogs riskante projekte.

2.2 Benaderings om die kritiese rentabiliteit te bereken

(i) *Toepassing van die benaderings*

Die benaderings wat deur die meewerkende ondernemings toegepas word om die kritiese rentabiliteit te bereken, verskyn in tabel 2.[3]

Tabel 2

Benaderings waarvolgens die omvang van die kritiese rentabiliteit deur die meewerkende ondernemings bepaal word

Metodes vir die bepaling van die kritiese rentabiliteit	Binnelands beheerde ondernemings		Buitelands beheerde ondernemings		Totaal	
	Getal	%	Getal	%	Getal	%
Geweegde kritiese rentabiliteit	5	20,8	4	28,5	9	23,7
Offerkostemetode	2	8,3			2	5,3
Rentabiliteit toegelaat deur die Pryskontroleur	2	8,3	2	14,3	4	10,5
Rentabiliteit wat onderneming in staat sal stel om langtermyndoelwit te bereik	1	4,2			1	2,6
Bepaal deur buitelandse beheermaatskappy			1	7,2	1	2,6
Volgens ondervinding en subjektiewe oordeel	9	37,5	5	35,7	14	37,0
Huidige rentabiliteit vergelyk met ander ondernemings	2	8,3	2	14,3	4	10,5
Huidige rentabiliteit subjektief aangepas	1	4,2			1	2,6
Weet nie	1	4,2			1	2,6
Koste van beherende kapitaal	1	4,2			1	2,6
Totaal	24	100,0	14	100,0	38	100,0

3 Vir 'n uiteensetting van wat die metodes behels, sien die bespreking oor hoe elke metode toegepas word (2.2(ii)-(v)).

Die groot aantal benaderings by die bepaling van die kritiese rentabiliteit is opvallend. Die twee uitstaande benaderings is volgens ondervinding of subjektiewe oordeel, en die metode van die geweegde kritiese rentabiliteit. Eersgenoemde benadering word deur 37 persent van die meewerkende ondernemings toegepas en laasgenoemde deur 24 persent van die meewerkende ondernemings. Daar is dus 'n groot aantal ondernemings wat van onverfynde benaderings gebruik maak. Hierdie bevindings stem in 'n groot mate ooreen met dié van ondersoeke in die buiteland.

Uit tabel 2 blyk dit dat die meewerkende ondernemings die benadering van die geweegde rentabiliteit in 'n groter mate deur buitelands beheerde as deur binnelands beheerde ondernemings toegepas word. So pas ongeveer 30 persent van die buitelands beheerde ondernemings hierdie metode toe teenoor ongeveer 20 persent van die binnelands beheerde ondernemings. By verdere ondersoek het dit geblyk dat die benadering in 'n groter mate by ondernemings met 'n relatief hoë persentasie vaste tot totale bates voorkom. So is sewe uit 21 ondernemings (33 persent) se vaste bates as 'n persentasie van totale bates meer as 40 persent in vergelyking met twee uit 17 (12 persent) wat laer persentasies het. Aan die ander kant word die benadering van ondervinding of subjektiewe oordeel deur 14 ondernemings toegepas; en hiervan het 10 uit 'n totaal van 19 (53 persent) relatief lae totale bates per werknemer in diens, naamlik minder as R10 000 per werknemer teenoor vier uit 19 (21 persent) wat 'n hoër totale bate per werknemer het.

(ii) *Geweegde kritiese rentabiliteit*

Volgens hierdie metode is die kritiese rentabiliteit die geweegde resultaat van die kritiese rentabiliteit van elke finansieringsvorm (geweeg volgens die verhouding van elke finansieringsvorm tot die totale kapitaal).

Van die nege meewerkende ondernemings wat hierdie benadering toepas, gebruik ses ondernemings die huidige kapitaalstruktuur om die kritiese rentabiliteit te bepaal en slegs drie ondernemings die verwagte kapitaalstruktuur. Geeneen van die ondernemings gebruik die een of ander ideale of optimale kapitaalstruktuur nie.

Markwaardes (slegs van gewone aandele) word deur vyf ondernemings gebruik om die hoeveelheid van elke finansieringsvorm te bepaal, en boekwaardes deur die orige vier ondernemings. In die

eersgenoemde geval word deur drie ondernemings as rede aangevoer dat dit die aandeelhouer se verwagting verteenwoordig terwyl twee dit as die mees realistiese metode beskou. Die gebruik van boekwaardes word om verskillende redes verkies. So verkies een onderneming dit omdat dit wys op verpligtings, een omdat dit eenvoudig is, een omdat herwaardasies van grond en geboue gereeld voorkom en die laaste onderneming het geen rede vir die gebruik daarvan nie.

Van die ondernemings wat hierdie benadering toepas, het vier aangedui dat projekte met 'n rentabiliteit hoër as die rentekoers van vreemde kapitaal waarmee dit ten volle gefinansier kan word, maar laer as die totale geweegde kritiese rentabiliteit finansieel aanvaarbaar is terwyl vier dit nie sal aanvaar nie en een dit verder sal ondersoek. Van die ondernemings wat dit sal aanvaar, motiveer twee dit deur daarop te wys dat 'n surplus verdien word, een verklaar dat wins per aandeel styg en een dat sulke projekte slegs aanvaar sal word indien solvabiliteit uiters gunstig is. Twee van die ondernemings wat sulke projekte nie sal aanvaar nie, wys daarop dat totale kritiese rentabiliteit in alle gevalle van toepassing is en twee dat dit op parsiële finansiering sou neerkom waarteen sekere bedenkinge bestaan.

'n Belangrike probleem by die berekening van die geweegde kritiese rentabiliteit is die bepaling van die kritiese rentabiliteit van gewone aandele. Die resultate van die ondersoek in dié verband verskyn in tabel 3.

Tabel 3 Maniere waarop die kritiese rentabiliteit van gewone aandele bepaal word

	Getal ondernemings
$\frac{\text{Wins per aandeel}}{\text{Markprys per aandeel}} \times 100$	3
$\frac{\text{Gemiddelde toekomstige wins per aandeel (indien projek onder oorweging nie aanvaar word nie)}}{\text{Markprys per aandeel}} \times 100$	1
$\frac{\text{Dividend per aandeel}}{\text{Markprys per aandeel}} \times 100 + \text{voorsiening vir groei}$	2
$\frac{\text{Wins beskikbaar vir gewone aandele}}{\text{Gewone aandele plus reserwes}} \times 100$	1
$\frac{\text{Wins per aandeel}}{\text{Markprys per aandeel}} \times 100 + \text{voorsiening vir groei}$	2
	9

Dit blyk dus dat sewe ondernemings wins per aandeel bo dividend per aandeel verkies. Die twee ondernemings wat dividend per aandeel verkies, doen dit omdat dit volgens hulle die kontantuitvloeiing per aandeel verteenwoordig. Wins per aandeel word deur drie ondernemings verkies omdat dit 'n aanvaarbare resultaat gee, deur 'n verdere drie ondernemings omdat dit volgens hulle 'n realistiese weergawe van aandeelhouers se verwagting is en deur een onderneming op grond van die oorweging dat dividendbeleid van onderneming tot onderneming kan verskil.

Van die ondernemings wat wins per aandeel as basis vir die bepaling van die kritiese rentabiliteit van gewone aandele gebruik, het die meeste 'n primêre finansiële beoordelingsmetode wat op netto kontantinvloeiing gebaseer is. By geeneen van die ondernemings skep dit ernstige probleme nie en moontlike teenstrydighede word nie ondersoek nie.

Van die nege meewerkende ondernemings wat die geweegde kritiese rentabiliteit bepaal, gebruik agt markwaarde per aandeel om die kritiese rentabiliteit van gewone aandele te bepaal. Die vernaamste rede hiervoor is die veronderstelling dat die beleggers rasioneel is en in staat is om gewone aandele te waardeer. Die markprys is dus 'n realistiese voorstelling van gewone aandeelhouers se verwagtings, aldus die meewerkende ondernemings.

By ses uit die nege ondernemings word vergelykings met ander ondernemings getref om te verseker dat die kritiese rentabiliteit van gewone aandele realisties is. Hierdie vergelyking geskied gewoonlik met ander ondernemings in dieselfde bedryfstak.

Al die ondernemings wat hierdie benadering toepas om totale kritiese rentabiliteit te bepaal, vereis dieselfde rentabiliteit van reserwes as van gewone aandele. By die ondernemings wat markwaardes gebruik om die omvang van elke finansieringsvorm te bepaal, is dit outomaties so en by dié wat boekwaardes gebruik, geskied dit op 'n eksplisiete wyse. Depresiasiereserwes word deur al nege ondernemings buite rekening gelaat by die bepaling van die totale kritiese rentabiliteit. Dit is outomaties so by die gebruik van markwaardes om die omvang van elke finansieringsvorm te bepaal.

Al die ondernemings wat hierdie benadering toepas, gebruik boekwaardes om die kritiese rentabiliteit van voorkeuraandele (indien enige) en rentedraende vreemde kapitaal te bepaal. Die uitgiftepryse, dividend- en rentekoerse is dus hier van toepassing. Slegs by twee van die meewerkende ondernemings is daar uitgereikte omskepbare kapitaal. Hierdie ondernemings onderskei glad nie tussen omskepbare en nie-omskepbare kapitaal nie.

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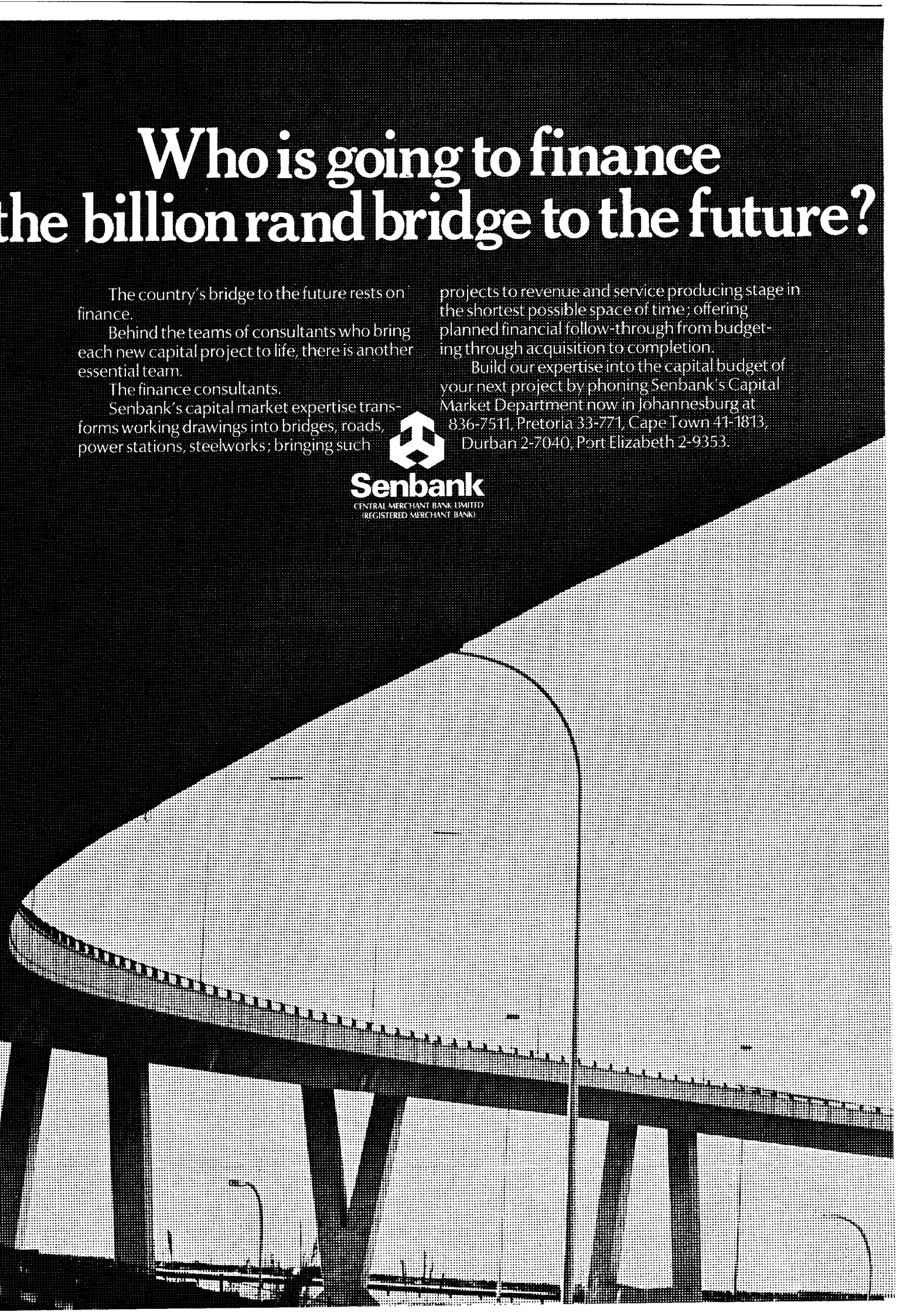


Die aangegewe rente- of dividendkoerse is in beide gevalle van toepassing.

Een onderneming laat alle korttermynkapitaal buite rekening by die bepaling van die totale geweegde kritiese rentabiliteit terwyl agt ondernemings slegs die nie-rentedraende kapitaal buite rekening laat. In al die gevalle word dit beskou as 'n vermindering van die totale kapitaalbehoefte vir bates en daarom word dit buite rekening gelaat. Van die agt ondernemings wat rentedraende korttermynkapitaal in aanmerking neem, maak slegs drie voorsiening vir moontlike rentekoersveranderinge. Die ander vyf ondernemings gebruik heersende rentekoerse.

(iii) *Offerkostemetode*

Die offerkostemetode staan ook as die metode van die alternatiewe rentabiliteit bekend. Die alternatiewe rentabiliteit kan onder andere die beleggingsrentabiliteit en die ondernemingsrentabiliteit wat verdien kan word, wees. Uit tabel 2 blyk dit dat slegs twee ondernemings hierdie benadering toepas om die totale kritiese rentabiliteit te bepaal. Hiervan is die een onderneming 'n betreklike klein onderneming volgens bates en die ander 'n betreklike groot onderneming volgens dieselfde maatstaf. Die betreklike klein onderneming het groot finansiële instellings genader om vas te stel wat 'n redelike gemiddelde vergoeding vir kapitaalverskaffers sou wees. Die uitgangspunt was die vergoeding van kapitaalverskaffers vir die verlies van kapitaal wat nie langer op ander wyses belê kan word nie.

Die betreklike groot onderneming wat hierdie benadering toepas, maak 'n subjektiewe beraming van wat die kapitaalverskaffer behoort te ontvang vir die kapitaal wat verskaf word. 'n Studie word gemaak van wat beleggers kan verdien deur middel van beleggings met laer risiko. 'n Premie om voorsiening te maak vir hoër risiko, inflasie en groei word op 'n subjektiewe wyse bygevoeg.

(iv) *Die metode van die koste van beherende kapitaal*

Hiervolgens is die totale kritiese rentabiliteit gelyk aan die kritiese rentabiliteit van die beherende kapitaal (gewone aandele en reserwes).

Uit tabel 2 blyk dit dat daar slegs een onderneming is wat hierdie benadering toepas. Die benadering word ten volle in 'n handleiding van die onderneming bespreek en geïllustreer. Vreemde kapitaal word buite rekening gelaat. Die sienswyse is dat alhoewel die gebruik van vreemde kapitaal 'n laer kritiese rentabiliteit tot gevolg sal hê, die risiko ook hoër sal wees in sulke gevalle. Daar word veronderstel dat die kritiese rentabiliteit van beherende kapitaal die totale gemiddelde kritiese rentabiliteit verteenwoordig.

Die maatskappy wat hierdie metode toepas, verklaar dat die wins voldoende moet wees vir die volgende (die aangegewe persentasies is slegs hipoteties en het nie betrekking op die werklike situasie nie):

1. 'n Jaarlikse dividend van ses persent op beherende kapitaal wat met vyf persent jaarliks sal styg om te voorsien vir inflasie.
2. Onuitgekeerde wins gelyk aan 2,5 persent van beherende kapitaal om voorsiening te maak vir groei. Hierdie bedrag styg jaarliks met vyf persent.
3. 'n Stygende behoefte aan vlottende batekapitaal as gevolg van inflasie. 'n Jaarlikse styging van vyf persent word voorsien.
4. Depresiasie wat op 'n vaste bedrag per jaar bereken word; 10 persent per jaar indien die projekleeftyd 10 jaar is en vyf persent per jaar indien die projekleeftyd 20 jaar is.

Tabel 4 'n Voorbeeld van die berekening van wins voor belasting vereis per jaar by die bepaling van die kritiese rentabiliteit waar die metode van die koste van beherende kapitaal toegepas word

	Jaar									
	1	2	3	4	5	6	7	8	9	10
Wins moet voldoende wees vir (elke item styg met 5% per jaar):										
Dividend (6% aanvanklik)	6,3	6,6	6,9	7,3	7,7	8,0	8,4	8,9	9,3	9,8
Onuitgekeerde wins (2,5% aanvanklik)	2,6	2,8	2,9	3,0	3,2	3,4	3,5	3,7	3,9	4,1
Addisionele vlottende batekapitaal benodig	1,1	1,1	1,2	1,2	1,3	1,3	1,4	1,5	1,6	1,6
Verhoging in depresiasie voorsien	0,4	0,8	1,3	1,7	2,2	2,7	3,2	3,8	4,4	5,0
Totaal (A)	10,4	11,3	12,3	13,2	14,4	15,4	16,5	17,9	19,2	20,5
Surplus netto kontantinvloeiing (depresiasie en onuitgekeerde wins) herinvesteer teen 10,3% na belasting (17½% voor belasting) (B)	—	1,1	2,3	3,6	4,9	6,3	7,7	9,3	10,9	12,5
Wins vereis van projek na belasting (insluitende uitgestelde belasting) (A − B = C)	10,4	10,2	10,0	9,6	9,5	9,1	8,8	8,6	8,3	8,0
Uitgestelde belasting voorsien (D)	7,9	1,6	0,5	(0,4)	(1,0)	(1,5)	(1,9)	(2,2)	(2,5)	(0,5)
Wins van projek vereis na belasting (C − D = E)	2,5	8,6	9,5	10,0	10,5	10,6	10,7	10,8	10,8	8,5
Belasting teen 41% (F)	1,7	6,0	6,6	6,9	7,3	7,4	7,4	7,5	7,5	5,9
Wins vereis van projek voor belasting (E + F = G)	4,2	14,6	16,1	16,9	17,8	18,0	18,1	18,3	18,3	14,4

5. 'n Styging van vyf persent per jaar in depresiasie om te kompenseer vir stygende vervangingskoste van bates.

Verder word belasting teen 'n koers van 41 persent in aanmerking geneem en bestaande investeringstoelaes is buite rekening gelaat. 'n Inisiële toelating van 15 persent per jaar plus 22½ persent afskrywing per jaar op die dalende saldo is gebruik om uitgestelde belasting te bereken. Voorts word surplusfondse geïnvesteer in ander projekte wat dieselfde rentabiliteit lewer as die bestaande projekte. Daar is veronderstel dat projekte R100 beherende kapitaal vereis. Hiervan word 80 persent in vaste bates en 20 persent in vlottende bates geïnvesteer. Projekleeftye van 10 en 20 jaar is veronderstel. Die berekening vir die projekleeftyd van 10 jaar verskyn in tabelle 4 en 5. Soos blyk uit tabel 4 word 'n kritiese rentabiliteit na belasting van ongeveer 12 persent bereken. By die beherende kritiese rentabiliteit word 'n subjektiewe risikopremie van drie persent voor belasting en 1,8 persent na belasting bygevoeg. Dit bring die totale kritiese rentabiliteit op ongeveer 14 persent na belasting te staan (by hoër inflasiekoerse sal die kritiese rentabiliteit natuurlik styg).

Tabel 5
'n Voorbeeld van die berekening van die kritiese rentabiliteit by die toepassing van die metode van die koste van beherende kapitaal

	Investerings		Netto kontantinvloeiing		Kontantstroom voor belasting	Belasting betaalbaar (F) – (D) in tabel 10/2	Kontantstroom na belasting
	Vaste bates	Vlottende bates	Depresiasie	Wins voor belasting (G) in tabel 10/2			
Aanvanklike investering	80,0	20,0			(100,0)		(100,0)
Jaar 1		1,1	8,0	4,2	11,1	(6,2)	17,3
Jaar 2		1,1	8,0	14,6	21,5	4,4	17,1
Jaar 3		1,2	8,0	16,1	22,9	6,1	16,8
Jaar 4		1,2	8,0	16,9	23,7	7,3	16,4
Jaar 5		1,3	8,0	17,8	24,5	8,3	16,2
Jaar 6		1,3	8,0	18,0	24,7	8,9	15,8
Jaar 7		1,4	8,0	18,1	24,7	9,3	15,4
Jaar 8		1,5	8,0	18,3	24,8	9,7	15,1
Jaar 9		1,6	8,0	18,3	24,7	10,0	14,7
Jaar 10		1,6	8,0	14,4	20,8	6,4	14,4
Vlottende bates: reswaardes		(33,3)			33,3		33,3
Interne rentabiliteite: Voor belasting 18,0% Na belasting 12,2%							

(v) *Ander metodes*

(a) Die kritiese rentabiliteit bepaal volgens ondervinding en subjektiewe oordeel

Hierdie is die metode waarvolgens die meeste ondernemings die kritiese rentabiliteit vasstel. Geen definitiewe metode, benadering of beleid waarvolgens die kritiese rentabiliteit bepaal word, kon aangedui word nie. In die meeste gevalle is gemeld dat die bedryfsleiding lank in dié spesifieke bedryfstak werksaam is, dat hulle ten volle vertroud is daarmee en derhalwe in staat is om die kritiese rentabiliteit te bepaal. 'n Redenasie soos die volgende is baie algemeen:

''n Rentabiliteit van 25 persent na belasting is te hoog omdat dit tot nuwe konkurrensie kan lei; 10 persent na belasting is te laag, want dit bied te min kompensasie vir risiko aan die kapitaalverskaffer. Dus moet die kritiese rentabiliteit tussen 10 en 25 persent na belasting wees.'

(b) Die huidige rentabiliteit op die een of ander manier aangepas

Die aanpassing van die huidige rentabiliteit kan op verskillende maniere geskied. Die aanpassing wat die meeste voorkom, volg uit die vergelyking met ander ondernemings in dieselfde bedryfstak. Dit kom dus daarop neer dat die beste ondernemingrentabiliteit in 'n spesifieke bedryfstak nagestreef word. Die ander manier van aanpassing is op 'n subjektiewe wyse. In werklikheid is hierdie manier van aanpassing baie nou verwant aan die voorafgaande metode, want die aanpassing sal die prestasie van ander ondernemings in die bedryfstak tog sekerlik in aanmerking neem.

(c) Maksimum rentabiliteit toegelaat deur die Pryskontroleur

In gevalle waar 'n onderneming onderworpe is aan prysbeheer word 'n spesifieke rentabiliteit deur die Pryskontroleur op kapitaal geïnvesteer toegelaat. Hierdie rentabiliteit word uitgedruk as 'n spesifieke persentasie van totale bates na opgelope afskrywing.

In sommige gevalle word hewige kritiek teen bogenoemde beperking van die maksimum rentabiliteit gelewer. Daar word aangevoer dat die rentabiliteite onvoldoende is om voorsie-

ning te maak vir vervanging van bates as gevolg van voortdurende prysstygings. Die ondernemings wat onderworpe is aan prysbeheer, verwerk die maksimum rentabiliteit soos bepaal deur die Pryskontroleur in vergelykbare rentabiliteite wat kan dien as kritiese rentabiliteite by die beoordeling van projekte.

(d) Rentabiliteit wat ondernemings in staat stel om langtermyndoelwitte te bereik

Die onderneming wat hierdie metode toepas, stel uitvoerige langtermynplanne op. Onder andere word 'n winsdoelwit vir die lang termyn geformuleer wat as 'n groeidoelwit kan dien. Langtermynplanne word ook opgestel van investeringsprojekte wat aangegaan sal word, asook van kapitaalbehoeftes. Deur middel van die toetsing van verskillende rentabiliteite word bepaal watter rentabiliteit die onderneming in staat sal stel om die winsdoelwit te bereik. Hierdie rentabiliteit word met die koste van vreemde kapitaal vergelyk om vas te stel of voldoende voorsiening vir risiko ingesluit is. Indien dit die geval is, dien hierdie rentabiliteit as kritiese rentabiliteit vir nuwe kapitaalinvesteringsprojekte.

2.3 Kritiese rentabiliteit en inflasie

Van die 38 meewerkende ondernemings het slegs vier te kenne gegee dat die kritiese rentabiliteit op die een of ander wyse aangepas word vir inflasie. Die oorgrote meerderheid van ondernemings laat dus die invloed van inflasie op die kritiese rentabiliteit buite rekening.

Die maniere waarop die aanpassing geskied, is soos volg:

— Twee ondernemings neem dit op 'n subjektiewe manier in ag en beraam 'n subjektiewe kritiese rentabiliteit.

— Een onderneming tel die huidige inflasiekoers by die berekende geweegde kritiese rentabiliteit.

— Een onderneming maak voorsiening vir die invloed van inflasie op dividende, vereiste onuitgekeerde winste, addisionele vlottende bates en hoër vervangingswaarde van vaste bates (sien tabelle 4 en 5).

3 BESPREKING VAN DIE BEVINDINGS EN GEVOLGTREKKINGS

Die bepaling van die kritiese rentabiliteit is seker die aspek van investeringsbeoordeling waaroor daar die meeste onsekerheid onder die groep van 38 meewerkende ondernemings bestaan. Dit blyk baie duidelik uit die persoonlike onderhoude wat met amptenare van die meewerkende ondernemings gevoer is. In die meeste gevalle was die betrokke amptenaar nie baie geneë om vrae oor hierdie aspek te beantwoord nie. Dit blyk ook duidelik uit die handleidings van die ondernemings (waar dit wel bestaan). In die handleidings word die beplannings- en begrotingsaspekte asook soms die finansiële beoordelingsmetodes volledig bespreek. Wat die kritiese rentabiliteit betref, is daar in uitsonderlike gevalle slegs 'n verwysing na die omvang daarvan bekend gemaak. Weinig inligting word omtrent die metode van berekening verskaf.

Die mees bevredigende aspek is dat die kritiese rentabiliteit tussen sekere grense varieer. Hiermee word die probleme by die kwantifisering onderstreep en voorts blyk dit dat dit gesonde praktyk is om konserwatief te werk te gaan.

Die groot mate waarin van onverfynde metodes gebruik gemaak word om die kritiese rentabiliteit te bepaal, is verontrustend. Die teoreties gevorderdste metode, naamlik die metode van geweegde kritiese rentabiliteit, word slegs op 'n beperkte skaal toegepas.

By die toepassing van die metode van die geweegde kritiese rentabiliteit, bestaan daar ook 'n aantal tekortkominge. **Eerstens** gebruik die meerderheid van ondernemings wat hierdie metode toepas, die huidige kapitaalstruktuur om die omvang van elke finansieringsvorm te bepaal. In baie gevalle is die huidige kapitaalstruktuur nie 'n goeie aanduiding van toekomstige finansieringsbeleid nie. Om hierdie rede word die verwagte finansieringsbeleid van 'n onderneming oor 'n redelik lang periode verkies. **Tweedens** bestaan daar groot onsekerheid oor die gebruik van markwaardes of boekwaardes om die omvang van die verskillende finansieringsvorme te bepaal. By eersgenoemde word reserwes buite rekening gelaat en by laasgenoemde word dit by die gewone aandelekapitaal gevoeg.

Derdens word die parsiële finansieringsbeginsel deur ongeveer die helfte van die ondernemings wat hierdie benadering toepas, gevolg. Dit lei daartoe dat hierdie ondernemings bereid is om projekte met rentabiliteite laer as die kritiese rentabiliteit, maar hoër as die rentekoers vir vreemde kapitaal wat vir die spesifieke projekte gebruik kan word, te aanvaar. Hierdie praktyk kan tot finansierings- en investeringsfoute lei. **Ten slotte** maak die meeste ondernemings wat hierdie benadering toepas, gebruik van markpryse om die kritiese rentabiliteit van gewone aandele te bepaal. Die feit dat al hierdie ondernemings se gewone aandele genoteer is, vergemaklik die toepassing van hierdie beginsel, maar dit bring sekere nadele mee soos byvoorbeeld fluktuerende markpryse en gevolglik ook fluktuerende kritiese rentabiliteite.

'n Bevredigende aspek aangetref is dat wins per aandeel meestal gebruik word om die kritiese rentabiliteit van gewone aandele te bepaal. Hiermee word dan ook te kenne gegee dat ondernemings algemeen aanvaar dat wins per aandeel in 'n groter mate deur gewone aandeelhouers as dividend per aandeel gebruik word om gewone aandele te beoordeel.

Die metode van die koste van beherende kapitaal is 'n stap in die regte rigting deur die onderneming wat dit toepas. Daar is egter 'n beswaar teen hierdie benadering en dit is naamlik die veronderstelling dat slegs beherende kapitaal gebruik word. Die voordele van vreemde kapitaal word dus buite rekening gelaat.

Dit blyk ook dat die meeste ondernemings nie inflasie in aanmerking neem by die bepaling van die kritiese rentabiliteit nie. Dit, tesame daarmee dat 'n groot aantal ondernemings ook nie aanpassings vir inflasie by die berekening van netto kontantinvloeiing en investeringsbedrae maak nie, lei tot die gevolgtrekking dat inflasie 'n aspek is wat te min aandag by die 38 meewerkende ondernemings ontvang.

By R. I. K. Jesse, BA (Cape Town), BSc (Cape Town)

Investment basics — I

THE REVERSE YIELD GAP AND REAL RETURN

Until the 1960's it was generally the case, both in South Africa and elsewhere, that returns on equities were **higher** than on fixed interest securities. The yield gap between the two was taken for granted and was supposed, largely, to reflect the riskiness of ordinary shares. Indeed, trustee portfolios seldom included any equities at all. The greater riskiness of equities was due, inter alia, to the following:

- A more cyclical business environment (and a closer proximity in time to the depression years of the 1930's), leading to greater fluctuations in earnings and dividends.
- The poor quality and quantity of information published by companies: prior to 1952, for instance, it was not necessary to present consolidated accounts.
- The absence of modern management techniques: proper costing and budgetary systems were, for example, lacking.

In such an environment the assets of the trust or pension fund were largely deployed into high quality, fixed interest stocks of government and semi-official institutions where capital and income were highly secure and where **real** returns over time could confidently be anticipated. Rates of interest were remarkably low by today's standards, but so were rates of inflation.

In South Africa, this happy state of affairs (low interest rates, low inflation) prevailed until the end of the 1960's.

% per annum

Year	Long-term gilt rate	Inflation	'Real' rate	Year	Long-term gilt rate	Inflation	'Real' rate
1950	3,6	4,0	−0,4	1960	5,4	1,4	+4,0
1951	3,6	7,4*	−3,8	1961	5,9	1,9	+4,0
1952	4,3	8,7*	−4,4	1962	4,8	1,5	+3,3
1953	4,5	3,5	+1,0	1963	4,8	1,2	+3,6
1954	4,3	1,8	+2,5	1964	5,0	2,4	+2,4
1955	4,8	3,1	+1,7	1965	6,0	4,0	+2,0
1956	4,8	1,9	+2,9	1966	6,5	3,7	+2,8
1957	4,8	3,0	+1,8	1967	6,5	3,4	+3,1
1958	5,3	3,4	+1,9	1968	6,5	2,0	+4,5
1959	5,3	1,2	+4,1	1969	6,5	3,3	+3,2

*Korean War inflation

Average real rate 1953 to 1969: 2,9%

The 1970's have seen sharply higher nominal rates of interest but a greater acceleration in rates of inflation, and long-term government stock income returns became negative in real terms after 1972.

% per annum

Year	Gilts	Inflation	Real return
1970	7,8	4,1	+3,7
1971	8,5	5,7	+2,8
1972	8,1	6,5	+1,6
1973	8,0	9,6	−1,6
1974	8,9	11,6	−2,7
1975	9,7	13,5	−3,8
1976	10,4	11,1	−0,7

Long-term holders (those who did not trade their fixed interest portfolios) of long-term gilts also found their capital values eroding as new issues were floated at successively higher rates. For example, as rates moved up from 8% to 10%, capital values fell from 100 to 80 — a decline of 20%. In recent years, funds have thus seen not only income returns that are negative in real terms but continuing (if normally unrealised) capital losses as well — a most unsatisfactoryat situion.

But to return to earlier years and the yield gap between equities and fixed interest. Memories of the 1930's were inevitably becoming dimmer, while at the same time the fundamental 'riskiness' of equity investment was diminishing as accounting and disclosure standards improved, stock exchange practices were tightened and general business cycles became less pronounced. The adoption by the authorities of the Economic Development Programme and the new focus on planned economic growth also drew attention to the long-term potential of equity investment.

Essentially, local investors, following their overseas colleagues, began to be aware that economic growth over time was likely to be associated (given the continued existence of a private sector) with profit and therefore **dividend growth.** If dividends were to **grow** and fixed interest was to remain fixed interest, the income return from equities would over time increasingly outstrip that from fixed interest. But investors would

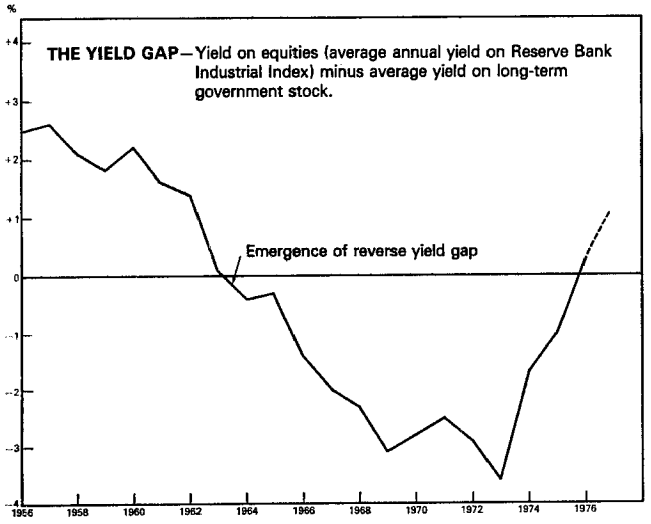
not allow market value yields to rise beyond a certain point if they had any confidence in the future stream of dividends from the company. They would always value the equity at a yield in the market they considered acceptable, so that any dividend **growth** would be reflected in upward movement in the share price: dividend growth, given a constant acceptable yield, would generate equivalent capital growth.

	Fixed interest			Equity	
	Year 1	Year 2		Year 1	Year 2
Income yield	6,0%	6,0%	Income yield	6,0% say	6,0%
Interest	6,0c	6,0c	Dividend	6,0c	6,6c say
Price	100c	100c	Price	100c	110c
Capital gain	—	nil	Capital gain	—	10,0%
Total return	6,0%	6,0%	Total return	6,0%	16,0%

The 10% increase in the dividend has translated itself (given the same market yield of 6% in Year 2) into a 10% capital gain and has generated a **total return of** 16%, substantially better than the return on the fixed interest security. In South Africa the equity had and still has a further attraction to many classes of investor arising from the favourable treatment for tax purposes of dividend income.

It soon, of course, became clear that given any sort of time horizon at all it was worth accepting a somewhat **lower** yield on the equity than on the fixed interest security. Growth in dividends would at some stage take the annual income from the equity up to and past the income from the fixed interest security and this took no account of capital growth! Thus, not surprisingly, the so-called cult of the equity developed and the reverse yield gap emerged. Particularly in other countries, its later stages in the 1960's were associated with the beginnings of an upward shift in inflation. This led to rising interest rates (and capital losses on gilts) and, for a time, enhanced company profit growth. Equities were thus seen as an inflation hedge and their superior merits appeared even more obvious.

In South Africa the reverse yield gap emerged first in the early 1960's as our chart shows:



THE YIELD GAP—Yield on equities (average annual yield on Reserve Bank Industrial Index) minus average yield on long-term government stock.

Almost the precise shift in acceptable yield shown above has, in fact, occurred since the beginning of the decade: in 1971 the average industrial yield (Reserve Bank index) was 6,0%. In April 1977 it stood at 12,1%.

But in the process a most interesting development has recently taken place: the reverse yield gap has disappeared. Following an annual average positive gap of 0,3% in 1976, the April 1977 gap was a positive 1,1% — the largest since 1962. Equities on this basis offer better value than for many years.

The gap continued until recently, reaching its greatest extent (on an annual average basis) in 1973. However, the period since 1970 has not, as most of us know, been associated with buoyant equity markets. This is despite very acceptable profit growth over the period. What has gone wrong?

The one word answer (perversely) is **inflation** which pushed up interest rates and thus the average acceptable equity yield, eroded the quality of corporate earnings and increased the average cover. While mild (1% to 5%) inflation might well have been 'good' for equities, 10% plus rates were clearly destructive in their influence.

	Equity	
	Year 1	Year 2
Income yield	6,0%	12,0%*
Dividend	6,0c	10,0c say
Price	100c	83c
Capital loss	—	17%
Total return	6,0%	−5%

*Via higher acceptable yield.

The Penrose Press