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Risk, the required rate of return, and aspects of South African management practice

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The pivotal role of the required rate of return to all financial decisions is well documented in the financial literature. However, many misconceptions exist with regard to the specification of the components of the required rate of return. In order to learn more about the possible components of the required rate of return, particularly the different risk premia, empirical information on the determination and use of the required rate of return by South African financial managers was obtained. From the findings of the empirical survey it was evident that the required rate of return is adjusted for a variety of risks. This enables the inference to be drawn that risk adjusted discount rates are being used when taking financial decisions. Further, it is evident that sensitivity analysis and judgemental approaches are used when adjustments are made to the required rate of return.

Die sleutelrol van die vereiste opbrengskoers met betrekking tot finansiële besluitneming is in die finansiële literatuur goed geboekstaaf. Nogtans bestaan daar heelwat wanopvattings met betrekking tot die spesifikasie van die komponente van die vereiste opbrengskoers. Ten einde meer te wete te kom oor die moontlike komponente van die vereiste opbrengskoers, meer in die besonder die verskillende risikopremies, is empiriese inligting rakende die vasstelling en gebruik van die opbrengskoers van Suid-Afrikaanse finansiële bestuurders, verkry. Die bevindinge van die empiriese ondersoek toon dat die vereiste opbrengskoers vir 'n verskeidenheid risiko's aangepas word. Hieruit kan die afleiding gemaak word dat risiko-aangepaste verdiskonteringskoerse gebruik word tydens finansiële besluitneming. Dit blyk ook dat sensitiwiteitsanalises en benaderings gegrond op bestuursoordele toepassing vind wanneer aanpassings aan die vereiste opbrengskoers aangebring word.

Introduction

The pivotal role of risk and return to all financial decisions is well documented in financial theory. From the definition of the required rate of return, namely that rate of return necessary to neither augment nor deplete investor wealth, it is apparent that any factor which can enhance or jeopardize the wealth position of investors should feature as a component of the required rate of return. As will be demonstrated in this article, the required rate of return comprises components which include a risk free rate of return and risk premia. However, as this article wil reveal, many misconceptions exist with regard to the specification of the components of the required rate of return. In order to learn more about the possible components of the required rate of return, particulary the different risk premia, empirical information on the determination and use of the required rate of return by South African financial managers was obtained.

The purpose of this article is firstly to provide an overview of the components of the required rate of return as a concept, and secondly, to report the findings of the empirical survey which specifically concern risk and the required rate of return. The article commences with an overview of the components of the required rate of return, is followed by the method of the empirical survey, and then proceeds to the findings.

Risk, the required rate of return and financial management: An overview

Introduction

The required rate of return is the minimum rate of return necessary to neither augment nor deplete but just maintain investor wealth. As such, the required rate of return comprises two major and distinct components, *firstly*, a risk free rate of return, and *secondly*, components which take into account risks such as business, financial, inflation, term structure, expectations, and tax risks. Since the risk free rate of interest is common to all investors, the differences in the required rate of return must originate in the second group of components, namely, the risk premia components.

The literature of capital budgeting is replete with discussions of risk and approaches for adjusting for risk such as the certainty equivalent coefficient and the risk adjusted discount rate approaches (Parry & Firer, 1990: 52–58). The use and discussion of approaches such as certainty equivalents and risk adjusted discount rates is *prima facie* evidence of an incomplete understanding of the required rate of return. When the required rate of return is correctly specified, risk as well as all other factors which could jeopardize investor wealth, are taken into account. A matter which comes to the fore relates to what academicians and practitioners are using as the required rate of return. Economists in general equate the required rate of return with an interest rate without specifying which interest rate (Paulo & Bosch, 1989: 7–9).

If the required rate of return is correctly determined, then there is no need to make use of certainty equivalent coefficient or risk adjusted discount rate approaches. Further, the certainty equivalent approach is unsatisfactory because it precludes analysis by means of net present value profiles, for if net present value is plotted on the vertical axis, the question arises as to what is being measured on the horizontal axis. It cannot be the risk free rate because the risk free

rate does not vary from zero to infinity but tends to be fairly constant.

Required rate of return and risk

Since the required rate of return enables the calculation of the financial acceptability of a financial decision, it is subject to all those macro- and micro-economic factors which affect valuations. Consequently, factors such as taxes, the risk free rate of interest, expectations, business and financial risk, inflation, and the term structure of the decision, need to be incorporated into the required rate of return, otherwise the required rate of return cannot operate as a concept which enables the maintenance of investor wealth.

In essence, the required rate of return should attempt to identify all factors which can disturb investor wealth and these factors should feature as components of this model. If the afore-mentioned risks are pertinent, then the required rate of return may be expressed:

RRR = f[(R_f;-e;br;fr;h;ts)(1-T)] ,where
RRR = required rate of return;
f = a function;
R_f = risk free rate of interest;
-e = expectations;
br = business risk;
fr = financial risk;
h = unanticipated inflation;
ts = term structure; and,
T = taxes.

Apart from the factors contained in this expression, other factors could be relevant, and would then feature in the above expression. The factors which comprise the above expression of the required rate of return are briefly discussed in the same sequences as enunciated.

Risk free rate of interest (R_f)

The determination of the risk free real rate of interest was first explained by Fisher (1930: 61–94,141–143,181–183) as a composite of two factors, the time preference of consumption, and, opportunity cost. The time preference of consumption implies that savers will postpone present consumption only when adequately compensated, and this is influenced by the opportunity cost of parting with financial resources. When funds are invested, the investor foregoes the opportunity of using those funds for current consumption, and, even if he is certain that he will recover those funds in the future, compensation is demanded for sacrificing current consumption. Compensation for foregoing consumption takes the form of the interest rate available on a riskless investment such as treasury bills, which are free from the risk of default (Brigham, 1985: 68). Thus, this compensation only covers the temporary abstinence from consumption.

The risk free rate is also influenced by investors' expectations about future rates of inflation because they will seek to protect themselves from declines in future consumption possibilities. Abstinence from present consumption does not dictate lower levels of future consumption, so, when inflationary expectations increase, investors demand a higher return on risk free investments. Thus, the risk free rate of interest is a risk free real rate of interest (Brigham, 1985: 66–67).

Providing the inflation rate is expected and is anticipated correctly, it is not a source of risk; however, when it is not anticipated, then it is a source of risk and this aspect must be brought into account as an inflation risk premium (Van Horne, 1986: 81; Mittra & Gassen, 1981: 123).

The significance of the concept of the risk free rate of interest in financial management is patent when the following illustrations are considered. *Firstly*, an assumption of *portfolio theory* is the existence of a risk free asset yielding a risk free rate of return within a perfect capital market (Bromwich, 1977: 313). The risk free rate of return forms an integral part of the *capital asset pricing model approach* to the required rate of return.

Secondly, in capital budgeting, the risk free rate of interest is central to the *certainty equivalent coefficient approach*. Whereas the net present value approach combines the discounting for time together with the adjustment for risk, the certainty equivalent coefficient approach disaggregates these two factors by adjusting for risk with a certainty equivalent coefficient, and discounting for the time value of money at the risk free rate of interest.

Thirdly, the risk free rate of interest serving the function of the required rate of return can be used to calculate net present value when conducting *simulation analysis* (Lewellen & Long, 1972: 19–32) within a simulation model such as the Monte Carlo model (Hertz, 1964: 96–108).

Thus, the risk free rate of interest forms an integral part of the required rate of return and under certain circumstances may be regarded as the required rate of return.

Expectations (-e)

The theory of expectations, of which there are four main variants, namely the *naive hypothesis* (Forsythe, Palfrey & Plott, 1982: 537–567), the *speculative equilibrium hypothesis* (Keynes, 1936: 156; Forsythe, Palfrey & Plott, 1982: 537–567), the *intrinsic value hypothesis* (Forsythe, Palfrey & Plott, 1982: 537–56), and the *rational expectations hypothesis* (Forsythe, Palfrey & Plott, 1982: 537–56), performs the function of enabling the transition from a general theory of the required rate of return, as a body of decision rules, to a theory of the required rate of return for the individual decision unit.

Financial management decisions, in spite of objective financial models, are often taken in a penumbra of doubt and uncertainty interwoven with inarticulate fears; nevertheless, because of the *ex ante* nature of financial management, expectations play a significant role and must be taken into account. The expectations of an investment proposal constitute a type of *ex ante* internal rate of return. If the expectations are realised, they then conform to the internal rate of return, but if they are not realised, then the causes of the divergence are investigated so that an improved approach to expectations for subsequent decision making may be developed.

Thus interpreted, expected rates of return serve to modify financial decisions when compared with the required rate of return, for these expectations provide clues to the likely

outcomes. If the expected rate of return exceeds the required rate of return, then in principle the proposal is acceptable. However, if the expected rate of return is less than the required rate of return, then in principle the proposal is unacceptable because the minimum rate of return necessary to maintain the wealth position of the investor is not expected to be realised. As has already been argued, the required rate of return cannot be considered in isolation of expected and actual rates of return.

The required rate of return is a positive concept indicating the currently prevailing situation (Brigham & Gapenski, 1985: 254–256). Expectations are a normative concept which provide clues as to what should materialise. If the expected rate of return is greater than the required rate of return, then, to discount the future stream of earnings at the expected rate of return is to understate the financial acceptability of the proposal. Consequently, expectations must feature as a negative entry. The calculation of net present value with any rate other than the required rate of return is in principle incorrect because it distorts the prime function of the required rate of return.

When the expected rate of return is less than the required rate of return, the component reflecting expectations, (-e), becomes -(-e), and is in effect added to the required rate of return. This is consistent with the principle that the required rate of return is the minimum rate of return necessary to maintain the wealth position of the shareholder intact. To ignore expectations in these circumstances would result in a calculation which overstates economic values, and the prime function of the required rate of return would not have been achieved. Clearly then, expectations must be incorporated into the required rate of return at the components level, but as a negative entry.

Business risk premium (br)

Business risk, which together with financial risk comprises a firm's unsystematic risk, is defined as the fluctuations in operating income or the fluctuations in earnings before interest and tax which occur as a result of business operations (Ben-Horim, 19: 275). Since business risk is the riskiness of a firm financed entirely from equity, it is today's risk about the level of future operating income, the risk of incurring a loss or of realizing a lower than expected operating income due to unforeseen unfavourable operating conditions.

Business risk comprises two categories of factors, external and internal factors. *External* factors refer to those operating conditions imposed on the firm from macroeconomic sources and are generally beyond the control of the firm. Examples would include sanctions, consumer tastes, and presidential decrees. These external risks can be unique to a firm depending on the specific environment within which the firm does business. For example, a firm supplying agricultural implements faces climatic risks such as brought about by droughts, cyclones, floods, and plagues of locusts; in addition the risks of war, theft, vandalism, riot and civil disobedience, are imposed from external sources (Reynders, Lambrechts & Scheurkogel, 1985: 249).

The *internal* factors of business risk relate to the efficiency with which a firm's business is conducted, specifically with regard to managerial competence, product diversification, asset technology and utilization, and the maturity of the firm (Mittra & Gassen, 1981: 133).

It is to these external and internal factors that Brigham (1985: 486–487) refers when he says that the causes of business risk are due to demand variability, sales price variability, input price variability, ability to adjust output prices for changes in input prices, and the extent to which costs are fixed.

Financial risk premium (fr)

Financial risk arises when financial leverage is introduced into the firm's capital structure by means of prior charge capital (Brigham, 1985: 491). When the rate of return earned on the assets financed by prior charge capital differs from the mandatory charges payable on the prior charge capital, financial leverage, either positive or negative, emerges, and financial risk exists. The greater the quantity of prior charge capital in the financial structure, the greater the variability of earnings after interest and tax, and this variability can jeopardize the liquidity and solvency of the firm (Reynders et. al., 1985: 249).

Financial risk is recognised as being an important contributory factor to the variability of earnings per share, and accordingly forms an integral part of the required rate of return.

Inflation risk premium (h)

Since a period of monetary stability has yet to be documented, monetary instability, which gives rise to inflation and disinflation, is the norm. The likely impact of inflation and disinflation must be brought into account in the required rate of return. The impact of monetary instability has long been recognised in the financial literature and its effect in determining the nominal required rate of return, known as the Fisher Effect, is expressed by means of the Fisher Equation (Copeland & Weston, 1988: 62).

The Fisher Effect suggests that the risk of inflation approximates the future expected rate of inflation, and an inflation risk premium equal to the anticipated inflation rate is demanded by investors and incorporated into the required rate of return. However, in the world of financial management, inflation is not always correctly anticipated, thus a distinction must be made between anticipated and unanticipated inflation (Van Horne, 1986: 81). Using this distinction, the risk of inflation has been defined as the possibility of receiving a real return lower than the nominal return due to improperly anticipated inflation (Mittra & Gassen, 1981: 123). Thus, when inflation is properly anticipated, there is no inflation risk because an appropriate compensating premium is incorporated at the disaggregative level of the risk free rate of interest. But, when inflation is not correctly anticipated, risk prevails because actual returns will not correspond to expected returns. This aspect of inflation must be brought into account by means of incorporating an inflation risk premium into the required rate of return.

The extent to which an inflation risk premium, which is incorporated into the required rate of return, can fully adjust and compensate for the diverse, profound and difficult to

measure effects of inflation, is by no means clear. Nevertheless, an adjustment of some kind is needed and until better approaches are developed, the inflation risk premium will continue to be used as a pragmatic approach to the problem posed by inflation.

The term structure element (ts)

The term structure of interest rates is relevant to the required rate of return because equity as well as debt may be used to finance projects, and will feature in the weighted average cost of capital. Moreover, as all projects will not have the same life duration, the difference in project life needs to be accommodated. For these reasons the term structure of interest rates must feature in the required rate of return.

The term structure of interest rates is a concept which tries, through theories and factors, to explain why interest rates differ for financial instruments of different life duration. The term structure of interest rates is defined as the relationship between yield and maturity on securities which differ only in the length of time to maturity (Mittra & Gassen, 1981: 204). Thus, all the other important factors, such as the coupon effect, Fisher Effect, and transactions costs, are held constant so that a meaningful analysis of the relationship between yield and time to maturity can be performed.

Three main theories have been proposed to explain the term structure element. *Firstly*, the unbiased expectations theory, first presented by Fisher (1896: 23–29) and refined by Lutz (1940: 36–63), states that the term structure is explained entirely by interest rate expectations. Thus, the long term rate is an unbiased average of the current short term rate and those future short term rates expected to prevail during the financial instrument's time to maturity.

Secondly, the uncertainty and liquidity premia theory, according to which Keynes (1936: 168, 182, 201), Hicks (1946: 164) and Kessel (Polakoff & Durkin, 1981: 519), assert that the longer the period to maturity, the greater the risk of fluctuation in the value of the principal. Therefore, investors prefer short term securities and borrowers prefer to sell long term securities. In order to induce investors to modify their preferences, an inducement in the form of a premium for liquidity must be offered, and this implies that the unbiased expectations theory is mis-specified.

The controversy germane to the liquidity premium approach and the incomplete explanation of observed time structure behaviour provided by the unbiased expectations theory gave rise to a *third* theory, market segmentation or 'preferred habitat' theory (Modigliani & Sutch, 1966: 178–197). The market segmentation theory, initially proposed by Walker (1954: 22–23) and Culbertson (1957: 489–504), suggests that the shape of the yield curve is determined by institutional pressures. Institutions aim to balance a liability with an asset of appropriate maturity so as to hedge against uncertain fluctuations in price and yields. This strategy is derived from the dynamic version of the optimal ratio of short term to long term funding model. For example, insurance firms with long term liabilities prefer longer maturities whereas commercial banks prefer shorter term maturities because they correspond more closely to the maturity structure of commercial bank deposit liabilities.

The important principle which emerges is that the market is characterized by participants with preferred maturity ranges. The risk of principal and income provide a powerful stimulus to hedge by matching the maturities of liabilities and assets. Thus, the important implication of this principle is that the market is segmented. Should sufficient inducement by way of yield differentials exist, these habitats will be temporarily modified until efficiency again prevails (Modigliani & Sutch, 1966: 178–197).

The austerity of these three theories is reduced when important factors such as transaction costs (Van Horne, 1973: 821–834), cyclical behaviour (Polakoff & Durkin, 1981: 82–92), the coupon effect (Van Horne, 1978: 116), and the call option (Copeland & Weston, 1988: 232, 236) are considered.

Tax (T)

The relevant required rate of return to an investor is a rate of return net of taxes, thus, taxes in the broadest sense, as well as expectations of changes in taxes, need to be considered. Taxes in the broadest sense would comprise all tax rates on capital, income, consumption, as well as non-discretionary expenditures forced on investors by legislators because such expenditures are not made at the discretion of the investor. If the thesis of Lerner (1944: 307–308) is accepted '...that the purpose of taxation is never to raise money...', since government '...can raise all the money it needs by printing it...', then not only is the true purpose of taxation '...to leave less money in the hands of the taxpayer...', but the rate of increase in money supply also constitutes part of the tax burden, because through the Fisher Effect (Van Horne, 1986: 565–566; Copeland & Weston, 1988: 61) it raises the nominal rate of interest.

If legislators want less of any goods or service they can reduce its supply by applying taxes because taxes, operating as a cost, raise the required rate of return, and reduce demand to which supply then adjusts.

Net present value, risk, and the required rate of return

Essentially, risk can be incorporated directly or indirectly into investment decision making when the present value criterion is used. When the direct approach is used, decisions are taken in terms of an index of financial acceptability and an index of risk. An example of this approach, which directly attempts to measure the risk of an investment, is the Markowitz Mean-Variance rule (Levy & Sarnat, 1986: 246–247).

In the case of the indirect approach to risk, each project is characterized by a single indicator of financial acceptability, namely a risk adjusted net present value, computed either by incorporating risk premia into the required rate of return and transforming it into a risk adjusted discount rate (Clark, Hindelang & Pritchard, 1984: 181–182), or by transforming the risky net cash flows into risk free net cash flows by multiplying the net cash flows by a certainty equivalent coefficient whose value lies between one and zero (Clark, Hindelang & Pritchard, 1984: 177), and discounting

at the risk free rate. Whilst the risk adjusted discount rate approach discounts for time preference and for risk, on the other hand, the certainty equivalent coefficient approach disaggregates time and risk. Nonetheless, in both these indirect approaches to risk incorporation, the required rate of return plays a central role, and in both cases the required rate of return is modified.

The empirical research of Blume, Friend & Westerfield (Levy & Sarnat, 1986: 280) revealed that the risk adjusted discount rate was the most popular approach for incorporating risk into project evaluation. In the case of South Africa, however, Parry & Firer (1990: 57) reported that a risk adjusted discount rate was used 'often' by only 14% of the respondents to their survey.

Hypotheses

This empirical survey tests in the most general terms the following competing hypotheses.

H_0: There are *no differences* among the normative financial theories of the required rate of return and the practice of financial management by South African listed firms,

against

H_1: There is *a difference* between the normative financial theories of the required rate of return and the practice of financial management by South African listed firms.

Scope and method of research

An empirical survey was conducted of all firms listed on the Johannesburg Stock Exchange (JSE). A complete survey was done and in total 733 questionnaires were mailed in July 1989 to the financial managers/directors of all firms which were listed on the JSE and which had a registered office in the Republic of South Africa. Of the 733 questionnaires mailed, 174 useable questionnaires were returned, representing a 23.7 response rate.

Questionnaire

The questionnaire was constructed on the basis of statements with the possible response continuum linked to a Likert-style four-point or five-point scale, requesting the respondents to indicate one of either four or five possible reactions to each statement. For example, the four point scale was constructed as follows: 1 = never; 2 = seldom; 3 = often; 4 = always.

The five point scale was constructed in terms of the following percentage intervals.

1 = not used (0–9%);
2 = hardly used (10–24%);
3 = infrequently used (25–49%);
4 = used (50–74%);
5 = frequently used (75–100%).

In open spaces provided, the respondents were invited to provide additional information and also were invited to record their comments on each statement in writing.

The main advantage of the *modus operandi* as described, is that it is uncomplicated and direct, hence easily comprehended. However, a serious point of criticism relates to the possibility that it is not the respondent's personal opinion that is under scrutiny, but rather his inclination to agree or disagree with the statements *per se*. None of the questions referred to the personal performance of the respondents, thus no reasons are likely to have existed for any bias in the responses.

The BMDP statistical package was used for calculations of frequency and percentage response scores. It was not feasible to perform analyses of association between responses and chi-square tests which serve as the basis for testing the Null Hypothesis, because of empty cells and low cell values. When the chi-square (X^2) statistic was used to determine whether any differences existed among the respondents, this statistic was found to be inapplicable as Cochran's rules (Cochran, 1954: 417–451) were violated in so far as the minimum expected values were smaller than one, and, at least 20% of the expected values were smaller than five. Thus, due to low cell values and empty cells, inferential statistics are not reported. However, in this regard it needs to be borne in mind that the empirical survey was in essence conceptual in nature, for it sought to establish how the required rate of return was determined and used by South African business practitioners.

At no stage was the financial performance of respondents contemplated in terms of the required rate of return. The conceptual empirical research of authors such as Brigham (1974: 17–26), Lambrechts (1975: 39–43), Petty, Scott, & Bird (1975: 159–172), Oblak & Helm (1980: 37–41), Gitman & Mecurio (1982: 21–29), and Parry & Firer (1990: 52–58) similarly reported conceptual information which could be used at a later stage for the construction of a model to determine financial performance.

Extent of response

In Table 1 the extent and distribution of responses are shown using the Stock Exchange classification as an index. Responses were received from all sectors barring the 'Fishing' sector. As already reported, 174 useable questionnaires were returned which is equivalent to a response rate of 23.7%. The response rate per sector varied considerably, with particularly low rates of response occuring in Clothing, Footwear and Textiles (2.5%), Development Capital (3.0%), and Banks and Financial Services (3.4%). High response rates were obtained from Steel and Allied (100%), Sugar (100%), Coal (83.3%), and Mining Houses (75%).

Problems experienced with respondents

There were three sources of disappointment. *Firstly*, replies were received from several prominent groups to the effect that it was company or group policy not to participate in any surveys. *Secondly*, it was disappointing to receive numerous letters from prominent firms stating that the cost of capital was a concept that was irrelevant to their financial management, or was not used, and consequently their participation was in their opinion meaningless. Such testimony, especially coming from firms listed in the sectors banking, finance, insurance and investments, is difficult, if not impossible, to accept. *Thirdly*, from a relatively early

Table 1 JSE listings and distribution of respondents by industrial activity

Sector	Firms listed	Respondents Number	% of Sector
Coal	6	5	83.3
Diamonds	5	2	40.0
Gold mines	61	39	47.5
Curtailed operations	1	0	0.0
Metals & minerals	20	11	55.0
Mining houses	12	9	75.0
Mining holding	18	8	44.4
Mining exploration	10	2	20.0
Banks & financial services	29	1	3.4
Insurance	16	1	6.2
Investment trusts	12	1	9.0
Property	29	4	13.8
Property trusts	14	3	21.4
Industrial holding	58	12	20.6
Beverages, hotels & leisure	16	3	18.7
Building & construction	28	12	42.8
Chemicals & oil	10	4	40.0
Clothing, footwear & textiles	40	1	2.5
Electronics, electrical, battery	47	6	12.8
Engineering	42	4	9.5
Fishing	2	0	0.0
Food	16	5	31.3
Furniture & household goods	21	6	28.6
Motor	18	2	11.1
Paper & packaging	21	4	19.0
Pharmaceutical & medical	10	1	10.0
Printing & publishing	10	2	20.0
Steel & allied	3	3	100.0
Retailers & wholesalers	59	7	11.9
Sugar	2	2	100.0
Tobacco & match	6	1	16.7
Transportation	11	2	18.2
Development capital	67	2	3.0
Preference shares	13	1	7.7
Obliterated codes*	—	8	—
Total	733	174	

*Eight respondents obliterated every 'firm-code' from the questionnaires which otherwise were satisfactorily completed. These eight responses have been included in the empirical survey.

stage it became apparent that firms whose majority shareholders comprised two major life insurers were not responding at all. Letters were then addressed to various members of these two controlling organizations, explaining the situation and attempts were made to cajole them into completing the questionnaire. The response was swift and direct: it was alleged that the cost of capital played no part in their decision making and consequently no worthwhile purpose could be served by participation in the survey.

Biographic details of respondents

Biographic information concerning the respondents was obtained with regards to job title, years of business experience, academic and professional qualifications, and the number of years of formal study necessary to attain such qualifications. From the biographic information obtained from the respondents it was evident that:

- only top management completed the questionnaires;
- almost 79% of the respondents were financial managers or financial directors;
- on average, the respondents had 12 years of business experience; and,
- 76% of the respondents were qualified/certified accountants.

Judged on the basis of their biographic profiles, the respondents would seem to be sufficiently well qualified and experienced to occupy the position of financial manager or financial director.

Table 2a Elements considered by respondents when calculating the required rate of return (N = 174)

Element	Frequency Always %	Often %	Seldom %	Never %	N/A %	N/R %
Risk free rate	7.5	20.1	44.8	14.4	—	13.2
Risk free rate plus risk premia	47.7	21.3	7.5	11.5	—	12.1
Firm's historic rate of return	2.3	18.4	10.9	54.6	0.6	13.2
Firm's present rate of return	4.6	21.3	8.6	52.9	0.6	12.1
Firm's expected rate of return	17.8	10.3	50.0	10.3	0.6	10.9
Branch of industry's historical rate of return	2.3	17.8	13.8	52.9	0.6	12.6
Branch of industry's expected rate of return	14.4	6.9	13.2	51.7	0.6	13.2
Expectations of growth and dividend policy	52.9	19.5	9.2	4.6	—	13.2
Cost of debt	58.6	10.3	7.5	10.3	0.6	12.6
Weighted average cost of capital	50.0	17.2	8.0	10.3	0.6	13.8
Interest rates	63.2	17.2	4.6	2.9	—	12.1
Target rates of return	17.2	59.8	6.9	2.9	—	13.2
Inflation rate	63.8	19.5	2.3	2.3	—	12.1

N/A: not applicable; N/R: no response.

Empirical findings on risk and the required rate of return

From the financial literature the determination of risk premia would seem to be problematic, and this would seem to be confirmed when the evidence of this survey is examined.

When calculating the required rate of return, a number of elements can be considered as constituent components of this concept. The respondents were asked to indicate the extent to which they considered a given set of elements when calculating the required rate of return. The information provided by the respondents is given in Table 2a.

If the information contained in Table 2a is regrouped so that the responses 'always' and 'often' are combined, and 'seldom' and 'never' are combined, as presented in Table 2b, it is evident that respondents 'always and often' included as elements of the required rate of return the following:

— the risk free rate plus risk premia (69%);
— expectations of growth and dividend policy (72.4%);
— the cost of debt (68.9%);
— the weighted average cost of capital (67.2%);
— interest rates (80.4%);
— target rates of return (77%); and,
— the inflation rate (83.3%).

The findings in Table 2b show that when the respondents determined the required rate of return, those elements which could jeopardize their wealth position were included as risk premia. This being the case, it is possible to draw the inference that the respondents use the risk adjusted discount rate as the required rate of return. In addition, when the response concerning the use 'seldom and never' of the risk free rate (59.2%) is considered, it is evident that the respondents cannot be using a certainty equivalent coefficient approach when performing financial valuations.

In order to obtain further information concerning the determination of the required rate of return, and in accordance with financial theory which suggests that the required rate of return comprises a number of components, another question was put to the respondents. From a given set of components (Table 3) the respondents indicated that important components 'always' included taxes (70.7%), business risk (66.1%), financial risk and expectations concerning the required rate of return (64.9%), inflation (62.6%), the risk free rate of return (60.9%), the term structure of interest rates (54.6%), and the yield (53.4%). These findings, apart from the inclusion of the yield as 'always' being an important component of the required rate of return which is wrong, provide further testimony that a risk adjusted discount rate approach rather than a certainty equivalent coefficient approach is being used.

In the process of probing the matter of risk, the respondents were asked yet another question in which they were asked to describe how they made adjustments to the required rate of return for risky projects. In Table 3 the JSE respondents indicated that sensitivity analysis and judgemental processes (48.9%) are the process most frequently used to make adjustments to the required rate of return for risk; and 10.9% reported use of hunch and gut feel.

When these responses (Table 4) are considered in conjunction with the responses to the previous questions, it would seem fair to say that the respondents are aware of risk factors, and do have an idea as to how they should be incorporated into the valuation process, but are unsure how to quantify these risks. The evidence of Table 4 provides

Table 2b Elements considered by respondents when calculating the required rate of return (N = 174)

Element	Frequency (Always + Often) %	(Seldom + Never) %	N/A %	N/R %
Risk free rate	27.6	59.2	—	13.2
Risk free rate plus risk premia	69.0	19.0	—	12.1
Firm's historic rate of return	20.7	65.5	0.6	13.2
Firm's present rate of return	25.9	61.5	0.6	12.1
Firm's expected rate of return	28.1	60.3	0.6	10.9
Branch of industry's historical rate of return	20.1	66.7	0.6	12.6
Branch of industry's expected rate of return	21.3	64.9	0.6	13.2
Expectations of growth and dividend policy	72.4	13.8	—	13.2
Cost of debt	68.9	17.8	0.6	12.6
Weighted average cost of capital	67.2	18.3	0.6	13.8
Interest rates	80.4	7.5	—	12.1
Target rates of return	77.0	9.8	—	13.2
Inflation rate	83.8	4.6	—	12.1

N/A: not applicable; N/R: no response.

Table 3 Components of the required rate of return (N = 174)

Component	Always %	Often %	Seldom %	Never %	N/A %	N/R %
Risk free rate	60.9	19.0	4.0	2.3	—	13.8
Inflation	62.6	19.5	2.3	0.6	—	14.9
Business risk	66.1	21.8	0.6	0.6	—	10.9
Financial risk	64.9	21.3	1.1	0.6	—	12.1
Systematic risk	3.4	44.8	16.1	19.0	—	16.7
Taxes	70.7	8.6	2.3	1.7	0.6	16.1
Yield	53.4	19.5	4.0	8.0	—	14.9
Term structure of interest rates	54.6	9.8	16.1	2.3	—	17.2

N/A: not applicable; N/R: no response.

Table 4 The manner of adjustment of the required rate of return for risky projects (N = 174)

Adjustment for risk	Frequency	%
No response	40	23.0
Sensitivity analysis and judgemental	85	48.9
Hunch/gut feel	19	10.9
Not done at all	15	8.6
Simulation/sensitivity analysis with targets in mind	5	2.9
Subjective/judgemental	3	1.7
Adjust beta coefficient	3	1.7
Interest rate multiplied by a factor of two	1	0.6
Prime overdraft rate plus 5 percentage points	1	0.6
Historic industry analysis	1	0.6
Disaggregates into business and financial risk	1	0.6

support for those findings of Parry & Firer (1990: 56) which concern the use of sensitivity analysis.

Those factors which can jeopardize investor wealth can be incorporated into the required rate of return or into the cash flow of the proposal being evaluated. For a given set of factors, the respondents were asked whether they made adjustments to the required rate of return, to the cash flow, or to neither. In certain instances the respondents indicated that they adjusted both the required rate of return and the cash flow. They were also asked to record any other factor that they used to effect adjustments to the valuation process. The responses are contained in Table 5.

From Table 5 it is evident that adjustment is made most often to the required rate of return in the case of inflation (70.3%), business risk (73.3%), financial risk (69.2%), the risk free rate of return (64%), systematic risk (45.3%), and the internal rate of return (48.8%). Such evidence provides further support for the use of a risk adjusted discount rate approach rather than a certainty equivalent coefficient approach. It needs to be noted that it is incorrect to adjust either the required rate of return or the net cash flow for the internal rate of return.

The respondents also indicated that they adjust the net cash flow in the case of interest rates (44.2%), currency instability (54.7%), expectations (41.3%), taxes (53.5%), and the term structure of interest rates (41.3%). This evidence conflicts with the evidence contained in Table 2b and serves to high-light the problem which managers have with the topic of risk and valuations. In the case of expectations, interest rates, and the term structure of interest rates, financial theory prescribes adjustments to the required rate of return and not to the cash flows, thus, aspects of financial practice are at odds with financial theory.

Conclusion

In this article the findings of an empirical survey of South African listed firms are reported as regards the identification and manner of incorporation of risk into financial valuations. The evidence suggests that the respondents are conversant with the risks which could jeopardize investor wealth, that they make use of risk adjusted discount rates, and that they make use of sensitivity analysis and judgemental processes to make adjustments to the required rate of return.

Table 5 Method of adjustment used by respondents for factors important to the valuation process (N = 174)

Factor	Adjust RRR %	Adjust NCF %	Adjust both %	No adjustment %	N/R %
Inflation	70.3	13.4	2.9	3.5	9.9
Interest rates	36.6	44.2	1.7	4.7	12.8
Business risk	73.3	1.7	0.6	2.9	21.5
Financial risk	69.2	3.5	1.2	2.9	23.3
Currency instability	12.2	54.7	—	9.3	23.8
Expectations	26.7	41.3	—	7.0	25.0
Taxes	15.1	53.5	2.9	5.2	23.3
Term structure of interest rates	25.0	41.3	1.2	7.6	25.0
Risk free rate	64.0	1.2	0.6	9.9	24.4
Non-discretionary expenses	2.3	7.0	1.2	64.5	25.0
Systematic risk	45.3	0.6	1.2	29.1	23.8
Internal rate of return	48.8	1.2	1.7	23.8	24.4

N/R: no response.

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