



The South African Companies Act of 2008 (SACA2008), and the Sarbanes-Oxley Act of 2002

Implications for corporate financial valuations reliant on the cost of capital

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Abstract

Purpose – The South African Companies Act of 2008 (SACA2008) seeks to reaffirm the company as a means of promoting the economic welfare and development of South Africa by encouraging efficient, transparent value-additive corporate management. The purpose of this paper is to present the important role of the cost of capital for financial valuations that are consistent with the purposes of SACA2008, as stated in Section 7.

Design/methodology/approach – The relevant sections of SACA2008 of this legislation were studied. The role of the cost of capital in performing and interpreting financial valuations was presented. As the CAPM is widely used, and in cases is the only approach used to estimate the cost of capital, an update of CAPM empirical evidence was presented to affirm the conclusion by Fama and French that the CAPM is not an acceptable way of estimating the cost of capital. The Sarbanes-Oxley Act of 2002 (SOX) was studied to ascertain the implication of using valuation criteria that lack empirical validity.

Findings – Management that makes financial decisions on the basis of criteria that have not been empirically validated may find it difficult to defend challenges to their efforts at complying with SACA2008 and promoting the success of the company.

Originality/value – From an extensive survey of publicly available literature, there is no evidence to suggest that research on the role of the cost of capital in helping achieve the purposes of SACA2008 has been published. Without a valid and reliable cost of capital it will be difficult to achieve the purposes of this legislation.

Keywords Capital asset pricing model (CAPM), Cost of capital, Financial valuations, Management, South African Companies Act of 2008, Sarbanes-Oxley Act of 2002, Sound research methodology, South Africa

Paper type Research paper

1. Introduction

The South African Companies Act of 2008 (SACA2008, n.d.), Act 71 of 2008, Section 7, states that its purposes include *inter alia*:

- promotion and development of the South African economy by encouraging entrepreneurship, enterprise efficiency, transparency, and high standards of corporate governance;
- promotion of innovation and investment in South African markets;
- reaffirmation of the company as a means of achieving economic and social benefits;
- creation of optimum conditions for the aggregation of capital for productive purposes, and for the investment of capital in enterprises and the spreading of economic risk;



- creation and use of companies, in a manner that enhances the economic welfare of South Africa as a partner within the global economy; and
- encouragement of efficient and responsible management of companies.

In short, these purposes aim at promoting the best possible economic development of South Africa, for all its stakeholders, by ensuring that scarce and costly resources are allocated within and beyond the corporate sector in an efficient transparent value-creating way. As part of the process of achieving these purposes that have been enshrined in law, corporate decision makers, especially managers and directors, are required to ensure that the decisions they make are economically and financially viable, for to do otherwise would jeopardise the attainment of these purposes. This in turn requires these corporate decisions be based on valid and reliable financial valuations that are consistent with the purposes of the SACA2008.

Corporate decisions that are consistent with the aspirational purposes of SACA2008 need to be based on analysis and valuations that contribute to the success of the company. Such analysis and valuations, as will be shown in this paper, invariably are dependent on a reliable and valid cost of capital when making investment, financing, and dividend decisions. Although a variety of approaches are available for estimating the cost of capital (Gitman, 2009, pp. 507-26), since the 1980s the capital asset pricing model (CAPM) has been particularly widely used. According to Fama and French (2004, p. 25), “[...] it is often the only asset pricing model taught [...]” and they describe it as “[...] the centrepiece of MBA investment courses” (Fama and French, 2004, p. 25). Since empirical investigation over many decades has failed to validate the CAPM, Fama and French (1996, 2004) unreservedly and emphatically state that it should not be used to calculate the cost of capital, expected rates of return or to evaluate managerial performance (Fama and French, 1996, 2004). If the cost of capital were not “[...] an extremely important financial concept [...]” (Gitman, 2009, p. 504), it could be possible to disregard its pivotal role in financial analysis, valuations, and decision making. Not only does the use of an invalid, unreliable and incorrect cost of capital frustrate managers and directors in their efforts to promote the success of the company in terms of SACA2008, but to the extent that one of the purposes of SACA2008 is the enhancement of the economic welfare of South Africa as a partner within the global economy, it has the capacity to frustrate the main purpose of the Sarbanes-Oxley Act of 2002 (SOX, n.d.). Countries and companies that aspire to complying with international best-practice standards, are ill-advised to disregard the requirements of SOX. SOX is especially relevant to some of South Africa’s most prominent companies, namely those that have dual listings, in South Africa and the USA, as well as those companies whose shares trade by means of the American Depository Receipt scheme (ADRs).

The purpose of this paper is to present the importance of the role of the cost of capital in achieving the purposes of SACA2008 from the perspective of financial valuations that are reliant on the cost of capital, hence the title of this paper. This is done by presenting relevant sections of statute, and then demonstrating the function of the cost of capital for companies so that there should be no doubt as to the importance of this concept at the corporate level. Since the CAPM is so widely used to calculate the cost of capital, an update of CAPM empirical evidence is undertaken to affirm the findings and subsequent recommendations by Fama and French (2004) that the CAPM is not an acceptable way of calculating the cost of capital. The implications for

managers and directors of using an empirically invalid and unreliable valuation model such as the CAPM to calculate the cost of capital, will frustrate their statutory duty to promote the success of the company in terms of SACA2008, and jeopardise the achievement of the purposes of this legislation. Moreover, to the extent that it is unable to satisfy Rule 702 of the Federal Rules of Evidence (Rule 702), it is likely to contravene SOX Section 807, §1348 regarding securities fraud. Such contravention has the potential to compromise South Africa's international economic aspirations as stated in SACA2008 Section 7.

2. The cost of capital, k , financial valuations, and the South African Companies Act of 2008 (SACA2008)

As already stated, SACA2008 Section 7 has clearly and unambiguously embedded in statute the purposes of this act that seek in concert to promote the economic welfare of the country. SACA2008 Section 8 makes provision for two types of companies, namely profit companies and non-profit companies. In the case of both types of companies, financial analysis, valuations and decisions that contribute to the success of the company invariably are dependant at some stage on a reliable and valid cost of capital, in the case of profit companies to deliver profit, and in the case of non-profit companies to deliver other benefits to society. The prime function of the cost of capital is to provide the basis for financial valuations that guide the allocation and structuring of financial capital in a manner that is consistent with the statutory objective of the type of company created in terms of SACA2008. This in turn requires managers and directors make investment, financing, and distribution decisions that enable the firm to satisfy a profit or non-profit status.

The investment decision comprises the acquisition and management of long term (capital budgeting) and short-term assets (working capital management). Capital budgeting is routinely undertaken on the basis of valuation criteria such net present value (NPV), the internal rate of return (IRR), the profitability index (PI), and the uniform annuity series (UAS).

The NPV criterion, which measures a project's financial acceptability in terms of its estimated incremental effect on the value of the firm, may be defined:

$$NPV = \sum_{t=1}^n \frac{Cf_t}{(1+k)^t} - I_0,$$

where:

NPV = net present value.

t = a time index that varies from one to n .

Cf_t = annual after tax cash flow in period t , that can have either positive or negative values.

k = cost of capital, the discount rate.

I_0 = initial investment outlay.

n = project's expected life.

Without the cost of capital, k , NPV cannot be calculated; if k is incorrectly estimated, the resulting NPV could provide an incorrect indication of the contribution

of to the value of the firm, with unacceptable investments being implemented, and acceptable investments being rejected. The NPV decision rule is to classify an investment with a positive NPV as acceptable, since implementation will enhance the value of the firm; where NPV is negative, the investment is unacceptable because it will reduce the value of the firm. Thus, the NPV criterion can be used as a screening control to identify projects that will enhance the value of the company, and also as a ranking control to identify which projects contribute greater value than other projects. In this context the NPV criterion functions both as a planning and control criterion, but without a valid and reliable k , it malfunctions and consequently jeopardises the purposes enunciated in Section 7 of SACA2008.

The IRR criterion evaluates the acceptability of investments on the basis of their cash flows by assigning only time value to the cash flows (Schall and Haley, 1988, pp. 223-6), thereby establishing the rate of return earned by the investment. It therefore follows that the IRR is defined as that rate of return that discounts a net cash flow to a NPV value of zero, or equivalently, that discount rate that equates the present value of the cash inflows with the present value of the cash outflows (Copeland and Weston, 1988, p. 29). Specifically:

$$NPV = 0 = \sum_{t=1}^n \frac{Cf_t}{(1 + IRR)^t} - I_0,$$

where:

IRR = internal rate of return.

Although k does not feature directly in the calculation of the IRR, the IRR decision rule operates in terms of k . Specifically, if the IRR exceeds k the proposal is acceptable, since it will enhance the value of the firm; if the IRR is less than k , the investment is unacceptable because it will reduce the value of the firm. Without k the IRR decision rule is inoperable for there is no other basis upon which to interpret the IRR, providing the IRR can be calculated, is unique, and does not have multiple or imaginary roots (Herbst, 1982, pp. 116-29; van Horne, 1972, pp. 79-81). If k is incorrect, the ensuing incorrect interpretation of the worth of the investment is inevitable, with unacceptable investments being implemented, and acceptable investments being rejected. This would jeopardise corporate success.

The PI, of which there are several variants, is a capital budgeting criterion, whose general form is defined (Lambrechts *et al.*, 1986, p. 154):

$$PI = \frac{\sum_{t=0}^n Cf_t / (1 + k)^t}{\sum_{t=1}^n I_n / (1 + k)^t}$$

where:

PI = profitability index.

k = cost of capital.

Cf_t = non-investment and non-working capital cash flows.

I_n = all investment cash flows including working capital items.

Since k features in both the numerator and denominator of the PI, without it the PI cannot be calculated. If k is incorrectly estimated then the resulting PI will

also be incorrect, and if used to guide managers and directors in their decision making, will result in decisions inconsistent with the promotion of the success of the company.

The UAS which is yet another capital budgeting criterion, is defined (Herbst, 1982, p. 83):

$$UAS = \frac{\sum_{t=1}^n C_t / (1 + k)}{((1 - (1 / (1 + k)^n)) / k)}$$

where:

UAS = uniform annuity series.

k = cost of capital.

In the case of the UAS, k features in both the numerator and denominator of the UAS and without it the UAS cannot be calculated. Yet again as with NPV, IRR, and PI, incorrect estimates of k frustrate and jeopardise decision making that seeks to promote the value of the company.

Not only does k feature prominently in long-term investment decisions, it also features in the short-term investment decisions that comprise the management of working capital. The purpose of working capital management is to ensure the effective and efficient utilization of the firm's long term (capital budgeting) investments, by ensuring optimal holdings of cash, debtors, and inventory. A variety of models have been applied to the management of current assets, and even a cursory consideration of the type of valuation that is undertaken to manage working capital requires k as an input. Typically, recourse is made to economic order quantity models (Redelinghuis *et al.*, 1985, pp. 160-5), such as Baumol's (1952, pp. 545-56) model, the Miller and Orr (1966, pp. 413-35) model, and the cash conversion cycle (Gitman, 1997, pp. 741-3) where k is used to calculate the benefits of reductions in the optimal level of short-term financing as a result of improvements in the average age of inventory, the average collection period, and the average payment period.

The basic economic order quantity model is defined (Redelinghuis *et al.*, 1985, pp. 160-5):

$$Q = \sqrt{\frac{2AP}{kP}}$$

where:

Q = number of units of inventory per order.

A = annual number of units of inventory consumed.

P = cost per order.

k = cost of capital.

In this, the most basic of order quantity models, k is explicit; without it is not possible to calculate the number of units of inventory per order.

The Baumol model for determining optimal cash balances, without which liquidity problems will arise, is defined (Baumol, 1952, pp. 545-56):

$$C^* = \sqrt{\frac{2FT}{k}}$$

where:

C^* = optimal cash transfer raised by selling marketable securities, or by borrowing.

F = the fixed transactions costs of trading securities.

T = total amount of new cash needed for transactions.

k = cost of capital.

Integral to the Baumol model is k , and without it the optimal cash transfer cannot be calculated.

Whereas the Baumol model requires the assumption that cash receipts and payments are known with certainty, the Miller-Orr model through a stochastic process attempts to accommodate the uncertainty relating to cash receipts and disbursements (Miller and Orr, 1966, pp. 413-35) and is defined:

$$Z = \left[\sqrt[3]{\frac{3F\sigma^2}{4k}} \right] + L, \quad \text{and} \quad H = 3 \left[\sqrt[3]{\frac{3F\sigma^2}{4k}} \right]$$

where:

Z = target cash balance.

F = fixed transactions costs.

σ^2 = variance of net daily cash flows.

L = lower cash control limit.

H = upper cash control limit.

k = cost of capital.

Yet again, k is integral to this model that sets upper, lower as well as target cash balances, and without it this model is undefined.

The financing decision refers to the sources of finance used to acquire and support the investment in the firm's assets, as well as their structural composition. Each source of finance has a cost of capital, k , such as the cost of equity in the form of ordinary shares (k_e) and preferences shares (k_{ps}), the cost of debt of various terms (k_d), the cost of convertible securities (k_{prefs}) and other hybrid forms of finance. Apart from the cost of capital of each specific source of finance, the cost of capital at the aggregate level when considering the firm as a whole, an overall cost of capital, can be calculated for different ratios of debt to equity. The range of aggregative approaches that include the net income approach (Durand, in Brigham, 1985, pp. 450-2), the operating income approach (Durand, in Brigham, 1985, pp. 450-2), the traditional approach (Brigham, 1985, pp. 450-2) and the approach of Modigliani and Miller (1958, pp. 261-97), are all dependant on k and the behaviour of k as the proportions of debt, equity, and hybrid forms of capital are varied. Whether a weighted average cost of capital, which also functions as a cost of capital k , or a weighted marginal cost of capital, or sequential marginal costing is used, reliance on k is an inescapable reality. Even in the world of perfect competition of Modigliani and Miller

(1958, pp. 261-97) which enabled their proposition that the value of the firm is independent of its capital structure, k (denoted as ρ in their paper) is pivotal to their analysis. In their 1958 seminal paper, ρ is used explicitly in 18 of the 34 equations that comprise their analysis (Modigliani and Miller, 1958). In short, it is not possible to contemplate meaningful attempts at promoting the success of the company in the absence of a valid, reliable, and numerically correct k when making the financing decision.

The dividend decision, that forms part of the distribution decision (Section 46 and Section 77 (33)(iv) of SACA2008), concerns the destination of net income after tax and after provision for standard and restrictive loan covenants, such as coverage ratios, sinking funds, and prescribed levels of liquidity and solvency. These funds, over which the directors have discretion, subject to compliance with statutory provisions regarding liquidity and solvency, may either be retained or distributed by way of a dividend, after such dividends has been declared. SACA2008 Section 46(1)(a)-(c) states that distributions must be authorised by the board of directors, and such distributions must satisfy the solvency and liquidity test (as specified in Section 4) immediately after completing the proposed distribution. In terms of Section 46(6)(a) and (b), a company director is liable in terms of Section 77(3)(vi) if the director was present at the board meeting when the board approved a distribution, participated in the making of such a distribution decision in terms of Section 74, and, failed to vote against the distribution despite knowing such distribution was contrary to the requirements of Section 46. Section 77(6) states that the liability of directors and associated persons who err in this way is joint and several.

Thus, the dividend decision, as with the investment and financing decisions, also needs to be consistent with the duty of promoting the success of the company and the purposes of SACA2008 Section 7, and should also be the result of a rigorous and transparent financial valuation process, which inevitably is reliant on k . Although it is not possible to do justice to the dividend decision and the controversies that surround it in this paper, it is possible to present some of the well known dividend valuation models, to illustrate the importance of k to the dividend decision.

Dividend valuations can be performed in terms of models that range from Miller and Modigliani (1961, pp. 411-33), who contend that the dividend decision is irrelevant, through to Gordon and Lintner (Brigham and Gapenski, 1985, p. 424) who contend that dividends are highly relevant to the promotion of the success of the firm. Rayner and Little (1971), Walter (1956, pp. 29-41), Wells Fargo Bank's security market plane (Brigham and Gapenski, 1985, p. 426), the partial equilibrium approach of Porterfield (1965, pp. 85-106), as well as many other researchers have sought to value the impact of dividends on the value of the firm for its shareholders. Despite the lack of agreement as to the relevance of dividends, the relevance of k is not subject to debate: it features in all these valuations and is at the core of the debate.

Consider, for example, the analysis of Miller and Modigliani (1961) which is replete with valuation equations that rely extensively on the inter-active relationship of ρ (the cost of capital k) to ρ^* (the IRR). Of the 27 equations that these authors use to construct their case, 23 equations explicitly feature k , namely equations (1)-(3), (5)-(20), (22)-(24), and (27). In the absence of k , Miller and Modigliani (1961) could not have prepared this seminal work.

Gordon and Lintner (cited in Brigham and Gapenski (1985, p. 424)) argued that since the return to shareholders comprises dividends and capital gains or losses, and since

there was a difference in the risks of dividends and capital gains or losses these two components of total shareholder return ought to be discounted at different costs of capital. Specifically, the k at which dividends should be discounted, ought to be less than the k at which capital gains were discounted because of the higher risk of capital gains. Pivotal to the approach of Gordon and Lintner, which is the most explicit version of the “bird-in-the-hand approach” is a differential k . Less explicit versions of the “bird-in-the-hand approach” include those of Graham *et al.* (1962, p. 533) and Clendenin and van Cleave (1954, pp. 365-76). Empirical support for shareholder preference for dividends as opposed to retained earnings has been demonstrated *inter alia* by Friend and Puckett (1964, pp. 658-82), Malkiel and Cragg (1970, pp. 601-17) and Graham *et al.* (1962, pp. 517-18).

When Rayner and Little (1971, pp 2 and 62) investigated the impact of low dividend payout ratios (thus high retention ratios) versus high dividend payout ratios (thus low retention ratios) on the growth rate of the corporation and the subsequent changes in the value of the corporation, they were able to demonstrate that it was neither low nor high dividend payout ratios that enhanced the value of the corporation. Rather, it was the inter-active relationship of the IRR earned from retained earnings in excess of the cost of capital of retained earnings that explained the enhancement of shareholder wealth in terms of the dividend decision. Without the cost of capital of retained earnings functioning as a yardstick against which the IRR can be evaluated, this analysis would not have been possible.

The Walter (1956, pp. 29-41) model which can be used statically to price shares, as well as dynamically to investigate the impact of different payout ratios on the market price of a firm’s shares, is defined:

$$P = \frac{D + (r/k_e)(E - D)}{k_e}$$

where:

P = market price of share.

E = earnings per share.

D = dividends per share.

R = IRR on incremental investment.

k_e = cost of capital of shares.

The cost of capital of the firm’s shares feature explicitly in the Walter model, and without it there is no Walter model. According to the Walter model, retained earnings and dividends are discounted at the same k (unlike the approach of Gordon and Lintner), and further a change in k would require a change in the payout ratio to enhance the market price of the shares.

The security market plane of Wells Fargo Bank (Brigham and Gapenski, 1985, pp. 426-8) that was developed for determining k and dividend yields, is the antithesis of the Gordon and Lintner approach where tax rates on dividends exceed the tax rate on capital gains: without k there is no security market plane.

From this presentation of the valuations that underlie the investment, financing, and dividend decisions, the importance of k for financial valuations and corporate decision making is clearly apparent. The information managers and directors need to fulfil their

duty in terms of Sections 4, 7, 8, 46, and 77 of SACA2008 cannot exclude k , for without it there is no credible or transparent basis for achieving the purposes this legislation.

In summary, consider the following “east-west” portrayal of a corporate balance sheet shown in Table I, which reveals both the cost of capital k , and the IRR of major categories of balance sheet items. Managers and directors need to know the cost of capital at the disaggregate level of all the firm’s assets and sources of financing for decision making at the project, divisional, or functional level, and also at the aggregate level for decision making at the level of the firm as a whole, for purposes of restructuring, mergers, acquisitions, takeovers, equity carve-outs, spin-offs, and split-ups, in short valuing the firm at the entity level before and after changes to the firm’s structure and composition. Managers and directors need to know how these costs of capital were calculated, how they have been aggregated, and how they will be managed for changes in variables, such as the bank rate, term structure of interest rates, taxes leverage and market volatility. However, managers and directors also need to know the IRRs that can reasonably be expected to be generated by the investment in corporate asserts, and the efficiency of corporate funding. A comparison of k with IRR , augmented by other criteria such as NPV and PI_{mod} form the basis of a rigorous, transparent and effective diagnostic framework to assess the performance of the company and its management. In the absence of this information, rational decision-making consistent with the profit or non-profit status of the type of company that has been created in terms of Section 8 of SACA2008, cannot be complete. For companies incorporated to make profits, the decision rules should be to accept projects and implement decisions that have positive NPV, and whose IRR exceeds k , and Table I provides a clear framework for this litmus test.

Assets whose $IRR > k$ will, by definition, augment the value of the company, whereas assets whose $IRR < k$ will, by definition deplete the value of the company. In the case of financing from equity and debt, where the $IRR > k$ of specific source of finance, the use of that source of finance is justifiable, but where $k > IRR$ of a specific source of finance, the value of the firm will be reduced as losses are made.

Managers and directors should be required to report on the IRR and k of major balance sheet items as well as provide information regarding the estimation of these IRR and k statistics in the interests of better management, greater transparency, and as part of their obligations in terms of Section 7 of SACA2008. The relationship of IRR to k and

IRR	k	<i>Fixed or non-current assets</i>	<i>Equity</i>	k	IRR
IRR	k	Land	Ordinary shares	k	IRR
IRR	k	Buildings	Preference shares	k	IRR
IRR	k	Plant	Retained earnings	k	IRR
IRR	k	Machinery			
			<i>Long term liabilities</i>	k	IRR
			Debentures	k	IRR
			Mortgages	k	IRR
			Term loans	k	IRR
IRR	k	<i>Current assets</i>	<i>Current liabilities</i>	k	IRR
IRR	k	Cash	Accruals	k	IRR
IRR	k	Marketable securities	Overdrafts	k	IRR
IRR	k	Debtors	Trade creditors	k	IRR
IRR	k	Inventory			
IRR	k	Prepayments	<i>Financing decision</i>	k	IRR
IRR	k	<i>Investment decision</i>			

Table I.
Balance sheet for
Limpopo Ltd, as at
31 December 2008

the changes in this relationship can assist management in identifying growth areas, as well as areas where value is declining and being destroyed. As an input to planning, controlling, organising and leading the company, this information is of a fundamental nature in measuring and ensuring corporate success.

The IRR criterion, despite well documented computational difficulties under specific circumstances (van Horne, 1972, pp. 79-81; Herbst, 1982, pp. 116-29), is preferred to the NPV criterion by management (Graham and Harvey, 2001, pp. 187–243; Bierman, 1993, p. 24; Gitman and Maxwell, 1987, pp. 41–50), and continues to be widely used (Burns and Walker, 2009, p. 84). Elali and Trainor (2009, p. 56) attribute the preference for the IRR criterion to *inter alia*, the general disposition of business-people toward rates of return rather than actual dollar returns, because interest rates the return key performance indicators such as return on assets, investment, and equity (the Du Pont equations) are expressed as rates of return, thus facilitating comparisons and interpretations.

3. CAPM empirical evidence update

As already noted, and despite the availability of other approaches, the CAPM is widely used to calculate the cost of capital. Harrington (1987, pp. 51-186) argued that the CAPM was not even good enough to be wrong because of the extent to which it is mis-specified. Empirical evidence over many decades shows that the CAPM is not empirically valid and therefore should not be used to calculate the cost of capital or expected rates of return, or to appraise the performance of management Fama and French (1996, 2004). In order to establish whether more recent publicly documented empirical evidence supports the CAPM, a literature survey of the period 2004 through 2008 was undertaken, with the main findings reported in Table II. Of the 11 papers identified in this survey, only one paper (Guan *et al.*, 2007) reported supportive evidence for the CAPM. The conclusion reached by Fama and French (2004, p. 25) that: “[...] the empirical record of the model [CAPM] is [...] poor enough to invalidate the way it is used in applications [...]” and “[...] The problems are serious enough to invalidate most applications of the CAPM” (Fama and French, 2004, p. 43), continue to be affirmed by the more recent evidence.

4. CAPM, SACA2008 and the Sarbanes-Oxley Act of 2002

The use of an invalid criterion, such as the CAPM, for financial valuations, is a matter of concern not only in terms of SACA2008, but also in terms of Rule 702 (n.d.) of the USA, and the SOX (n.d.). Consideration of SOX is necessary because this legislation applies not only to Johannesburg Stock Exchange listed companies but also to South African companies firms with dual or multiple listings, as well as firms traded in terms of the ADRs because such listings encompasses some of the largest and most prominent South African public companies. The importance of the conclusion reached by Fama and French (2004) and affirmed by subsequent empirical research has a legal dimension as well as a valuation dimension for managers, consultants and other professionals who perform valuations and allocate capital on the basis of the CAPM. Invalid and unreliable valuation criteria are likely to produce spurious results and consequently cannot satisfy Rule 702, in which case these criteria may infringe SOX and the SACA2008.

In 2000, an important change was made to the rules of evidence in the USA with the enactment of the new Rule 702 that replaced the Daubert rule. Scientific, technical,

Author (year)	Finding
Guo (2004)	CAPM fails to explain the predictability of stock market returns
Arnott (2005)	CAPM does not survive empirical scrutiny; CAPM is factually incorrect, empirically, and theoretically
Bartholdy and Peare (2005)	Unable to empirically verify CAPM for the estimation of expected stock returns
Lewellen and Nagel (2006)	The conditional CAPM performs nearly as poorly as the unconditional CAPM
Fama and French (2006)	Variation in beta unrelated to size and the value-growth characteristic goes unrewarded throughout 1926-2004
Guan <i>et al.</i> (2007)	Evidence is presented that supports the validity of the CAPM
Nagel <i>et al.</i> (2006)	The "LMS" model, the simplest model outperforms the CAPM, the Fama and French (1992) three-factor model, the Carhart four-factor model, the co-skewness model, and the co-kurtosis model in forecasting future stock returns
Iqbal and Brooks (2007)	The risk-return relationship appears to be non-linear and is most profound in recent years when the market performance was very good and the market was highly liquid
DeWet <i>et al.</i> (2007)	Unable to empirically validate the CAPM
Bernardo <i>et al.</i> (2007)	Unless beta is adjusted for growth, even after controlling for operating and financial leverage, the cost of equity is substantially mis-estimated
Markowitz (2008)	A linear relationship between excess returns and beta does not imply payment for risk; securities with the same risk structure almost surely will have different expected returns
Schrimpf and Schröder (2009)	Additional evidence of the empirical shortcomings of the conventional CAPM in explaining the cross-section of German stock returns is presented; conditioning information can potentially improve the model's performance, but it is important to carefully select the conditioning variable which is subject to instability through time
Burns and Walker (2009)	Reported major disagreements regarding the application of CAPM even though it was the dominant model used for valuing equity

Table II.
Update of empirical evidence of the CAPM since Fama and French (2004)

or other specialised evidence that does not satisfy the criteria prescribed by the new Rule 702 of 2000 of the USA (Rule 702) significantly impacts upon the admissibility of expert witness testimony and the role played by the trial court in the USA. Thus, Rule 702 attempts to provide guidance for the courts and litigants regarding the factors that need to be considered in determining whether an expert witness's testimony is reliable.

The new Rule 702 of the USA states:

If scientific, technical, or other specialised knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training or education, may testify thereto in the form of an opinion or otherwise if:

- (a) the testimony is based upon sufficient facts of data;
- (b) the testimony is the product of reliable principles and methods; and
- (c) the witness has applied the principles and methods reliably to the facts of the case.

Clearly Rule 702 requires an expert witness to provide sufficient supportive empirical evidence and reliable methodology in order to provide a sufficient basis for application,

and furthermore, it requires a proper (judicious) application of the methodology to the facts of the case under discussion. Scientific, technical or other specialised evidence that does not satisfy the criteria prescribed by Rule 702 significantly impacts upon the admissibility of expert witness testimony and the role played by the trial court in the USA. The first requirement of Rule 702 is not supported by the empirical evidence of the CAPM. Since the CAPM is the product of unreliable principles and methods, namely unsound research methodology, it does not satisfy the second requirement of Rule 702. Criteria that fail to satisfy the first two criteria of Rule 702 cannot satisfy the third requirement of this legislation.

Sound research methodology requires performance and valuation metrics ethically and accurately report, describe and explain the phenomena being researched (Cooper and Emory, 1995, p. 9; Sekaran, 2000, pp. 19-34; Cavana *et al.*, 2000, pp. 27-44), and that these metrics be valid, reliable and interpretable (Cooper and Emory, 1995, pp. 148-56; Gauri *et al.*, 1995, pp. 46-51; Davis, 1996, pp. 172-80; Sekaran, 2000, pp. 204-10; Cavana *et al.*, 2000, pp. 210-15). An operational performance metric that is used by statisticians, actuaries, managers, analysts, bankers, consultants, and other professionals, whether for appraisals, valuations, asset pricing or asset allocation, needs to satisfy the minimum requirements of sound research methodology and sound ethics. Ethics features prominently in SOX, for example Sections 103 and 406.

Expert witness testimony with regard to valuation criteria, such as the CAPM, that are inadmissible as expert witness testimony in terms of Rule 702 to a USA court of law, cannot constitute acceptable practice for listed corporations in terms of SOX. Indeed, such practices may be considered a form of snake-oil. Where a person possessed of expert skills and knowledge, by education, training, or practice, has made use of unreliable and invalid methodologies to perform valuations, and accordingly allocate capital, or make financial decisions for listed corporations, it is likely to contravene SOX Sections 807 and 1348 regarding securities fraud.

Section 1348:

Whoever knowingly executes, or attempts to execute, a scheme or artifice [...] to obtain, by means of false or fraudulent pretences, representations, or promises [...] shall be fined under this title, or imprisoned not more than 25 years, or both.

In terms of Section 1348 of SOX, theories, models, criteria and decision rules that are wrong, lack empirical validity, are not epistemologically rigorous, defy sound research methodology, are an abstraction from reality and cannot be satisfactorily operationalised, may be construed as an attempt to commit a false or fraudulent pretence, particularly in the case of an expert professing specialised knowledge, skills, and competence.

5. Conclusion

The objective of SACA2008, as stated in Section 7, is to promote the economic welfare and development of South Africa by reaffirming the role of the company as a means of achieving economic and social benefits. This legislation states specifically in Section 7 that this is to be accomplished by encouraging entrepreneurship, high standards of corporate governance, and the management of resources in an efficient, transparent value-creating manner, domestically and globally. Integral to the management of scarce and costly resources that is value-additive and contributes to the financial success of the company, are financial valuations which, as shown in this paper, are dependent on

a valid and reliable cost of capital, k . In so doing, this paper has sought to present the importance of the role of k in attaining the purposes of SACA2008. Although there are a number of approaches to the estimation of k , since the 1980s the CAPM has been particularly widely used even though it has yet to be empirically validated. As an invalid, unreliable and incorrect criterion the CAPM will frustrate managements' statutory duty to promote the success of the company in terms of SACA2008 Section 7, and thereby jeopardise the achievement of the purposes of this legislation. Moreover, to the extent that South African companies aspire to ensuring a successful global footprint, they need to be compliant with international standards, such as prescribed in SOX. Management whose financial valuations and transactions are based on criteria that do not comply with Rule 702 are unlikely to satisfy the requirements of SOX, in particular Section 807 §1348 relating to securities fraud that comes about as a consequence of using questionable valuation criteria. Management that makes financial decisions on the basis of criteria that have not been empirically validated, may find it difficult to defend challenges to their efforts at promoting the success of South African companies in terms of SACA2008.

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Further reading

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