

Board structure and intellectual capital performance in South Africa

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Abstract

This article examines the relationship between board structure and the intellectual capital performance of South African publicly listed companies. Board composition was analysed in terms of gender and ethnic diversity, using cross-sectional multiple regressions. The population of the study included all South African companies listed on the JSE Securities Exchange during 2003. The final sample, after the transformation of the data, consisted of 117 companies. The empirical results indicated a positive significant relationship between the percentage of ethnic members on the companies' boards of directors and intellectual capital performance. Based on the results of this study, it is argued that South African publicly listed companies may be able to enhance their intellectual capital performance by using an ethnically diverse board of directors.

Key words

Board structure
Diversity
Ethnic
Gender
Intellectual capital
Performance
South Africa

1 Introduction

The relationship between corporate governance practices and company performance has been a matter of considerable interest to academic researchers and the general public for several decades. This interest has heightened in the last five to ten years after a number of high profile corporate failures. One of the important elements of corporate governance is the structure of the board of directors. A board of directors may be regarded as a team of individuals with the fiduciary responsibilities of leading and directing a firm, with the primary objective of protecting the firm's shareholders' interests (Abdullah 2004). The role of a board of directors is to monitor the performance of the company so that the interests of shareholders are protected (Kosnik 1987). One may suppose that if the board performs its

duties effectively, the value of the company is likely to increase, and the wealth of the shareholders will therefore be enhanced.

Despite the importance of the results and empirical findings of previous investigations on the relationship between board structure and company performance, there are two central limitations to the value of such findings. First, the majority of empirical studies examining the relationship between board structure and company performance have relied on data obtained from first world markets such as the United States and the United Kingdom – see, for example, Agrawal and Knoeber (1996), Brickley, Coles and Jarrekk (1997), Hermalin and Weisbach (1991) and Klein (1996). It is questionable whether these results can be extended and applied to other regions of the world, particularly to emerging markets such as South Africa, where capital flow is limited, markets are less sophisticated, production is more labour intensive¹, and educational and professional resources are limited (Van Staden 1998).

Second, with the exception of Mitchell Williams (2000a), previous studies have analysed the relationship between board structure and company performance by measuring performance using traditional measures such as return on assets and return on equity. A growing number of political leaders, academic researchers and corporate executives are, however, recognising the significance of a company's intellectual capital relative to its performance and future viability. Results and findings from previous studies examining the relationship between board structure and company performance using traditional performance measures may be questioned in future, given that it has been projected that intellectual capital will become the 'pivotal factor in corporate growth and development' (Luthy 1998).

The increasing importance of a company's intellectual capital is illustrated by empirical work such as that of Luthy (1998), who states that intellectual capital is 'becoming the pre-eminent resource for creating economic wealth'. The role of intellectual capital in creating value has become crucial in achieving a competitive advantage in the market (Usoff 2002). This role is also highlighted by Drucker (1993:54), who states that 'knowledge has become the key economic resource, and the dominant and perhaps even the only source of competitive advantage'.

The creation, management and maintenance of intellectual capital fall within the ambit of a field broadly known as knowledge management. Knowledge management has become the new mantra of modern organisations that wish to compete in an increasingly turbulent and competitive world (Fier & Mitchell Williams 2003). More and more, it is accepted that the only true competitive advantage for organisations in the long term is knowledge; in other words, it is important to know how organisations create or acquire knowledge; how they retain and store knowledge; how they disseminate and use knowledge; and how they protect and manage the knowledge that they have (Dzinkowski 2000).

In today's knowledge-based economy, three of the most hidden dynamic factors of an organisation are its knowledge and know-how, which is created by and stored in its people (thereby creating human capital), its relationships (social capital), and its organisational information technology systems and processes (organisational capital) (Edvinsson & Malone 1997).

¹ This is due to the lower cost of labour.

This article analyses the relationship between gender and ethnic diversity on the board of directors of South African companies listed on the JSE Securities Exchange, and intellectual capital performance where the *Value Added Intellectual Co-efficient (VAIC™)* was used to measure company performance.

2 A South African focus

A major feature of this article is its focus on South Africa, because South Africa is an emerging economy that wishes to attract foreign capital and investment. It is not always easy to distinguish South Africa from the perceptions commonly held about the entire Southern African region, as is demonstrated by the Rand's volatility in relation to events in Zimbabwe (PriceWaterhouseCoopers 2003). However, adopting strong corporate governance standards and practices may contribute to a perception that South Africa is a suitable destination for foreign capital.

The 1994 King Report on Corporate Governance for South Africa (Institute of Directors of South Africa 1994)² was developed as an initiative of the Institute of Directors of South Africa to promote sound corporate governance practices in South Africa (Institute of Directors of South Africa 1994). In 2002, an updated version of this report, the King Report 2002 (King II) was released. King II (Institute of Directors of South Africa 2002) recognises the importance of board structure, accountability and independence to effective corporate governance. King II contains guidelines and standards on good corporate governance practices, and in essence adopts the concept of stakeholder reporting. King II highlights the importance of directors' responsibilities and board composition. The report recommends that South African companies have a unitary board structure that comprises executive and non-executive directors, preferably with a majority of non-executive directors, of whom a sufficient number should be independent of management in order to ensure the protection of minority shareholders' interests. Paragraph 2.2 of the Code (Institute of Directors of South Africa 2002) stipulates that South African companies should consider the country's demographics in relation to the composition of the board.

Within the South African context, the Employment Equity Act (South Africa 1998) recognises that as a result of apartheid and other discriminatory laws and practices, there are disparities in employment, occupation and income within the South African labour market; and that those disparities disadvantage some groups of people. The designated groups, as defined by the Act in Chapter one, paragraph one, include black people, women and people with disabilities (South Africa 1998). The Act states in Chapter one, paragraph two that it aims to promote equal opportunities and fair treatment in employment by eliminating unfair discrimination and implementing affirmative action measures to redress the disadvantages in employment experienced by members of the designated groups, in order to ensure their equitable representation in all occupational capacities and levels within the workforce (South Africa 1998). The King Report on Corporate Governance and the Employment Equity Act therefore provide for the relevance of this study within the South African context.

The results and empirical findings of this study may be of interest to regulators, investors, corporate executives, special interest groups and academic researchers, not only

² The King Report incorporates a Code of Corporate Practices and Conduct.

in South Africa, but also in other regions of the world. This study explores areas that emerged from some of the limitations of the empirical results from previous board structure and corporate governance studies. Intellectual capital performance research is still in its infancy, as much of the debate in this area so far has focused on how this concept can be measured (Guthrie 2000). Evidence from this study assists in determining the value of VAIC™, developed by the Austrian Center for Intellectual Capital, for future application in performance-based accounting studies.

The remainder of the article is organised as follows: the next section provides a brief review of the underlying theoretical perspectives adopted in this study and prior empirical studies that have examined the relationship between ethnic and gender diversity on the board of directors and company performance. Testable hypotheses were formed based on this review. The research method is then discussed, followed by an outline of the empirical results. In the final section, the empirical results are discussed. Concluding remarks and suggestions for future research are also presented in the last section.

3 Underlying theoretical perspectives and hypotheses

The majority of studies examining the relationship between board structure and company performance have used economic-based theoretical perspectives of corporate governance. Such theoretical perspectives have traditionally postulated two essential mechanisms of governance, namely markets and corporate hierarchies (Hollingsworth, Schitter & Streek 1994:5). The Simple Finance Model of corporate control identified by Hawley and Williams (1996) is perhaps the leading example of the view that corporate governance relies only on markets and corporate hierarchies; the model defines the essential issue of corporate governance as the need ‘to construct rules and incentives³ to effectively align the behaviour of managers (agents) with the desires of principals (owners)’ (Hawley & Williams 1996:21).

The relevance of corporate control models that only identify two modes of governance is questionable when one considers the increasing importance of a company’s intellectual capital for its future survival and performance. This is because the management and monitoring of intellectual capital involves interaction with several stakeholder groups, such as employees, unions, consumers and consumer groups. As a result, it may be necessary to consider broader theoretical models of corporate control. Hollingsworth and Lindberg (1985:221-222), for example, extended the two-mode approach to governance by identifying ‘four distinctive forms of governancemarket, hierarchies, the clan or community and associations’. Each of the four modes identified by Hollingsworth and Lindberg (1985) involves a ‘separate logic of collective action and social order’ (Streck & Schmitter 1985:11). The stakeholder model of corporate control identified by Hawley and Williams (1996) adopts the four-mode approach stipulated by Hollingsworth and Lindberg (1985). This model implies that the company ‘is a system of stakeholders operating within the larger system of the host society that provides the necessary legal and market infrastructure for the firm’s activities’.

It is beyond the scope of this article to evaluate all the respective theoretical corporate control models. Instead, this article adopts the attitude that theories on corporate

3 That is implicit and explicit to the contract.

governance that emphasise only two modes of control are not necessarily wrong, but fail to go into sufficient detail to capture the entire scope of corporate governance. Such theoretical perspectives do offer some insights, but have a limited application in respect of intellectual capital. Theories with a four-mode point of view offer insights that are relevant to the discussion of the relationship between corporate governance and company performance, including intellectual capital performance. In an effort to recognise the respective shortcomings of the traditional mainstream views of corporate governance and those of new emerging perceptions, this article adopts stakeholder-agency theory as its underlying theoretical perspective.

Hill and Jones (1992) argue that agency theory, the dominant theoretical framework used to explain corporate governance and firm performance relationships in this study, may be conceptualised as a 'nexus of contracts' between various stakeholders other than just management and shareholders. Apart from extending the narrow view of corporate governance to encompass other stakeholders, there are three other important features of stakeholder-agency theory. First, stakeholder-agency theory adopts a broad definition of corporate governance activities. That is, 'relatively successful governance can take a variety of forms, and hybrid forms are quite explicable and not unusual' (Buck, Filatitechev & Wright 1998:87). It is important for any successful company that there must be a form of effective control that limits and controls managerial power. This control can be generated and implemented by various stakeholders that can constrain the actions of management through various combinations of governance measures, such as voicing complaints or withdrawing financial facilities, products, or similar reactive signals (Buck *et al.* 1998). Another important feature of stakeholder-agency theory is that it provides for the notion of a time dimension (Hill & Jones 1992). In a constantly changing business environment that is subject to considerable uncertainty, such as that present in South Africa, particularly during the 1990s, this scenario leads to short-term market imperfections. In recognition of this fact, stakeholder-agency theory acknowledges that control over management in the short term is imperfect, but that in the long run market processes tend to select the most efficient organisational forms (Hill & Jones 1992). Finally, stakeholder-agency theory redefines the position of senior management in a company; stakeholder-agency theory assumes senior management to be the dominant stakeholder in a firm, rather than merely the principal managerial agent of shareholders' interests (Hill & Jones 1992).

Corporate governance can be described as the 'concrete means by which stakeholders try to control dominant managers, rather than as a vague concept of the means by which corporate decisions are determined abstractly' (Buck *et al.* 1998:86-87). Consistent with Anglo-American's approach to corporate governance, corporate governance can also be defined as the process and structure used to direct and manage the business affairs of the company to enhance business prosperity and corporate accountability with the ultimate objective of realising long-term shareholder value, whilst taking into account the interests of other stakeholders (Cadbury Report 1992). The Cadbury Report (1992:15) defines corporate governance as the 'system by which companies are directed and controlled'. The concern of corporate governance has so far been mainly the accountability of boards of directors and the board's effectiveness (Cadbury 1997).

In essence, stakeholder-agency theory suggests that corporate governance may be instigated and implemented by the various stakeholders of a company. Within a stakeholder-agency framework, this study examined the relationship between intellectual

capital performance and board composition, defined in terms of the percentage of women and ethnic persons on the boards of directors of South African publicly listed companies.

3.1 Gender and ethnic diversity on the board of directors

Some corporate governance experts claim that greater demographic diversity amongst members of corporate boards of directors will lead to improvements in a company's financial performance (see, for example, Daily, Certo & Dalton 1999; Heidrick & Struggles Inc 1996; Kotz 1998). In the past, boards of directors were regarded as a 'homogenous group of elites who have similar socioeconomic backgrounds, hold degrees from the same schools, have similar educational and professional training, and as a result, have very similar views about appropriate business practices' (Westphal & Milton 2000:366). However, given the current dynamic global business environment and the emerging phenomenon that more power is being assigned to a wider set of stakeholder groups, it is argued that increased diversity on boards of directors will improve decision-making (Coffey & Wang 1998; Useem 1993). The South African business environment throughout the 1990s and early 2000s was one of great uncertainty and change (Mitchell Williams 2000b). Increased diversity amongst the boards of directors of South African publicly listed companies may therefore have led to less insular decision-making processes and greater openness to change, placing the firm in a better position to react and survive the ever-changing environment (Gormley 1996; Kotz 1998).

Board diversity can broadly be defined as variety amongst the members of boards of directors with regard to characteristics such as kinds of expertise and managerial background, personality, learning style, age, education and values (Mitchell Williams 2000b). Two demographic characteristics that have been recognised as offering benefits to a corporation through increased diversity in recent years, not only by academics but by corporations, is the representation of women and different racial groups on a company's board of directors (see, for example, Daily *et al.* 1999; Heidrick & Struggles 1996; Kotz 1998).

Empirical findings reported in the literature on the relationship between the percentage of women on boards of directors and company performance have been somewhat contradictory. Early research, such as that by Zald (1969), failed to find a significant relationship between the presence of women on a board of directors and company performance. Such studies concluded that the lack of any relationship was due to the low number of women actually on boards of directors. Some later studies, such as those by Bilimoria and Piderit (1994) and Zahra and Stanton (1988), found similar results and attributed the lack of a clear relationship between the number of women on the board of directors and company performance to the fact that women are disadvantaged by the types of assignment they are traditionally given when they serve on a board of directors. Judge (2003) noted that, while women were securing positions on company boards, the impact on company performance was negative. In her article she stated: '[S]o much for smashing the glass ceiling and using their unique skills to enhance the performance of Britain's biggest companies – the triumphant march of women into the country's boardrooms has instead wrecked havoc on companies' performance and share prices' (Judge 2003:21). Studies performed by Kesner (1988) and Provan (1980) had opposing results; empirical results found support for the proposition that having more women on the board of directors enhanced a company's performance. Mitchell Williams (2000a) found that there is a

positive significant relationship between the percentage of women on the board of directors and a company's intellectual capital performance.

A variety of arguments have attempted to explain how a company may benefit from the presence of women on its board of directors. It has been suggested that women can bring different sociological perceptions and understandings to the table to broaden the scope of a board of directors' decision-making processes. Graves and Powell (1988), for example, found that female directors were more concerned with the company's responsibility to the community and with incorporating this concern as a criterion for business growth and development than male directors were. One aspect of intellectual capital is a company's reputation with its external stakeholders, including the community. This article therefore suggests that boards of directors with a higher percentage of women will make decisions on the future intellectual capital performance of the entity with more sensitivity toward community concerns than male-only boards.

Another potential benefit of having a greater percentage of women on boards of directors is the increased ability to attract and communicate with a wider scope of employees to increase the competitive abilities of the firm – it has been suggested that, as the proportion of women on boards of directors increases, this enables the company to compete better for talented employees within the labour market (Graves & Powell 1988). The latter authors also argue that a company with women on the board of directors is in a better position to attract women employees. By being more receptive to the contributions of women at the top, companies could gain a competitive advantage, allowing them to deal more effectively with diversity in their product and labour markets (Fernandes 1993).

In addition, the presence of women on a company's board of directors may assist in facilitating strategic change, increase financial performance, and provide greater idea generation and innovation (Wiersema & Bantel 1992). Mattis (1993) and Schwartz (1980) argue that by virtue of their position at the top of the corporate hierarchy, female directors can serve other corporate women in unique ways: as role models, as mentors and champions for high-performing women in organisations, and as advocates of keeping the recruitment, retention and advancement of women high on their board's agendas. Given these important business functions served by women, it is important to address their presence and role in the governance of companies.

Despite the suggested benefits of having women on boards of directors, women in top leadership positions in the corporate world are rare (Bilimoria & Piderit 1994). Several studies have found that relatively few women serve on corporate boards (see, for example, Directors and Boards 1992; Karr 1991; Von Glinow & Mercer 1988). Adler (2000) and Davidson and Burke (2000) argue that there is little doubt that women continue to be disadvantaged in the workplace and are underrepresented in leadership positions. Evidence suggests that while women are typically confronted by an invisible barrier preventing their rise into leadership ranks, the 'glass ceiling' (Kanter 1977; Morrison, White & Van Velsler 1987), men are more likely to be conveyed into management positions by means of a 'glass escalator' (Williams 1992).

The glass ceiling refers to a situation where women are prevented from reaching leadership ranks due to an unspecified invisible barrier, while the glass escalator refers to an invisible mechanism enabling men to attain leadership positions. These terms imply that women face unspoken barriers in attaining leadership positions while men achieve positions of authority more easily and are in fact assisted in climbing the corporate ladder.

South Africa has experienced significant transformations in the business arena since the abolition of apartheid and the election of the first democratic government in 1994. Affirmative action and black economic empowerment practices have resulted in increased pressure to achieve greater ethnic diversity on the boards of directors of South African publicly listed companies.

Crano and Chen (1998) suggest that the inclusion of an ethnic person⁴ into the social mix of the board of directors has the potential to stimulate divergent thinking in the decision-making process. It has been argued that ethnic members will be able to offer unique perceptions on issues that can alter the conventional views of the board of directors through the encouragement of others to question the assumptions that had previously implicitly guided the reasoning of the board (see, for example, Laughlin 1992; Moscovici & Faucheaux 1972; Nemeth 1986). Recent research has supported the view that board members from different ethnic groups may assist in adjusting the thinking of an established board of directors (see, for example, Crano & Chen 1998; Hitt & Barr 1989; Nemeth 1986). In addition to promoting change in the original perceptions and views held by the board of directors, the introduction of a board member from a different ethnic group may also assist in generating more original approaches to intellectual and decision-making tasks (Bantel & Jackson 1989; McGrath 1984; Williams & O'Reilly 1997).

A resource-based theory of competitive advantage and strategy analysis suggests another possible benefit of the introduction of members from different ethnic groups to a board of directors (Crano & Chen 1998). The latter authors suggest that this theory proposes that a firm generates competitive advantage and better performance through its ability to capitalise on and apply its internal resources, such as its employees, in uncertain and dynamic contexts. Given that most members of the South African workforce are persons of ethnic origin, companies that can deal effectively with this internal resource will achieve a greater competitive advantage and improved performance.

3.2 Testable hypotheses

From the above discussion, the overarching proposition is that boards of directors with greater ethnic and gender diversity were better placed to acquire the key resources underlying intellectual capital performance. The following testable hypotheses were therefore postulated:

Hypothesis 1

H₁: There is a significant positive relationship between the percentage of women on the boards of directors of South African publicly listed companies and intellectual capital performance.

Hypothesis 2

H₂: there is a significant positive relationship between the percentage of ethnic persons on the boards of directors of South African publicly listed companies and intellectual capital performance.

4 In this context, 'ethnic' refers to black people as defined by the Employment Equity Act in Chapter one, paragraph one – black is used as a generic term describing Africans, Indians and Coloureds (South Africa 1998).

4 Research method, data and model

4.1 Selection of data

This study assumes that relationships do exist between intellectual capital performance and board structure. The construction of statistical models in the form of linear regressions serves as a vehicle to verify or refute the presence of relationships between interacting variables.

Due to the difficulty of acquiring information from private companies, it was decided to limit this study to public companies listed on the JSE Securities Exchange. For the purposes of this study, the extent of company performance was measured using statutory annual reports. Data was collected from the 2003 fiscal year annual reports of companies listed on the JSE Securities Exchange. The primary source of information for this study was the secondary database from McGregor BFA. McGregor BFA supplies real-time and historical fundamental information on South African listed companies.

Consistent with prior studies, Vafeas and Theodorou (1998:391) argue that companies in the financial and utility industries should be excluded from the population because 'regulation masks efficiency differences across companies, potentially rendering governance mechanisms less important. A total of 123 companies displayed the key variable staff costs, and disclosed the composition of the board of directors. Staff costs consist of the overall expenditures for employee salaries and wages (Pulic 1998). Six companies were excluded because of data screening and transformation procedures. A total of 117 companies were included in the final data set.

All negative variables were removed. The rationale for this procedure was the predictive purpose of the regression equation and, particularly, the nature of the predictive variables. Using the 'women' variable as an example, the regression model seeks to fit a straight line to the predictive ability of the number of women on the board of directors, and since the number of women on a board of directors can logically never be less than zero. Thus, the presence of a negative intellectual capital variable, or a loss, can therefore not be catered for in the model, as this would make the number of women less than zero. This logical limitation therefore required the analysis to be performed using only positive observations for the profitability and intellectual capital measures. Although this is considered to be a limitation of the model, it is not considered to affect the conclusions reached in this study.

4.2 Multiple regression models

The contribution of board structure to intellectual capital performance was tested by using two different multiple regression models. These models are specified by the following equations:

- 1). $VAIC^{TM} = f(\text{PERGENDER}, \text{TA}, \text{ROA}, \text{ROE}, \text{TOR}, \text{E}, \text{R}, \text{S}, \text{LNDTA})$;
- 2). $VAIC^{TM} = f(\text{PERETHNIC}, \text{TA}, \text{ROA}, \text{ROE}, \text{TOR}, \text{E}, \text{R}, \text{S}, \text{LNDTA})$;

Where:

$VAIC^{TM}$ = Value Added Intellectual Coefficient;

PERGENDER = the percentage of women on the board of directors;

PERETHNIC = the percentage of ethnic persons on the board of directors;

TA = total assets;

ROA = return on assets ratio, defined as profit before taxation but after interest, divided by total assets;

ROE = return on equity ratio, defined as profits after interest and taxation, divided by shareholders equity;

TOR = turnover ratio;

E = electronics and resources industries, dummy variable;

R = retail industry, dummy variable;

S = service industry, dummy variable;

DTA = natural log of debt to asset ratio.

4.3 Measure of the dependent variable

Empirical findings have illustrated the increasing importance of a company's intellectual capital to its overall value. For example, the Brookings Research Institute found that in 1962, 62% of a company's value was represented by its physical capital; this percentage had declined to 38% by 1992. Luthy (1998) described the growing significance of intellectual capital by stating that intellectual capital was becoming the pre-eminent resource for creating wealth and that the relative importance of tangible assets had decreased over time due to the increasing importance of intangible, knowledge-based assets.

Intellectual capital is a broad term that is considered to be synonymous with a firm's intangible assets (Mitchell Williams 2000b). However, to date, there is no precise agreement on the definition of intellectual capital. Stewart (1997:67) defines intellectual capital as 'packaged useful knowledge'. Brookings (1996:12) offers a more comprehensive definition, stating that intellectual capital refers to the 'combined intangible assets which enable a company to function'. It was beyond the scope of this study to assess the respective merits of the various definitions of intellectual capital. For the purposes of this article, intellectual capital is defined as the enhanced value of a firm that is attributable to assets, generally of an intangible nature, resulting from the company's organisational function, processes and information technology networks, the competency and efficiency of its employees and its relationship with its customers (Mitchell Williams 2000c).

For the purposes of this article, the concept of intellectual capital was categorised into four major components. This is consistent with recent literature on intellectual capital such as that by Brookings (1996). These components are termed and described as follows:

human resources (statements about the employees' qualifications, the management system's handling of the human development task and the employees' levels of satisfaction);

customers (statements about the composition of customers, the company's efforts to develop the customer relationship and customer satisfaction and loyalty);

information technology and processes (the scope and availability of IT systems and an activity-orientated expression of a number of business activities especially favoured by the company); and

intellectual property (statements by a company on its investment into and development of creative ideas and items to which rights have been assigned, and items such as trademarks, patents, trade secrets and confidential information).

Mindful of the criticism of the various measures of intellectual capital, two screening criteria were adopted in selecting the measure for intellectual capital performance in this study. These criteria were, first, that the basic underlying feature of the measure should be based on a key component of intellectual capital rather than on physical capital; and second, that the measure should be simple enough to enhance understanding and to allow relative ease of data collection. The use of an uncomplicated intellectual capital measurement model can be justified for various reasons, including behavioural, cognitive and cost/benefit reasons. With increased complexity, there is an increased risk of ambiguity, which has the potential to reduce the understandability and applicability of the intellectual capital model. It is also suggested that the value of an intellectual capital measurement model comprising log checklists and complicated simulations between indicators may be undermined by the inability of stakeholders to comprehend all the indicators at once (Mitchell Williams 2000a). Finally, from a pragmatic perspective, it can be argued that if the cost of designing, implementing, administering and updating the intellectual capital measurement model outweighs the benefits derived by company management and its stakeholders, there is little incentive for using the model.

Considering the two screening criteria outlined above, the Value Added Intellectual Coefficient (VAICTM) (Pulic 1998) was selected to form the underlying basis of measurement for intellectual capital performance in this study. This measure is considered to be a 'universal indicator showing abilities of a company in value creation and representing a measure for business efficiency in a knowledge based economy' (Pulic 1998:9). VAICTM is an analytical procedure designed to enable management, shareholders and other stakeholders to monitor and evaluate effectively the efficiency of value added (VA) by a company's total resources and each major resource component. Formally, VAICTM is the sum of three separate indicators:

- Capital employed efficiency (CEE) – an indicator of value added (VA) efficiency of capital employed;
- Human capital efficiency (HCE) – an indicator of value added (VA) efficiency of human capital; and
- Structured capital efficiency (SCE) – an indicator of the value added (VA) efficiency of structured capital.

Equation 1 formalises the relationship algebraically.

Equation 1

$$VAIC_i^{TM} = CEE_i + HCE_i + SCE_i$$

Where

$VAIC_i^{TM}$ = VA intellectual coefficient for firm i;

$CEE_i = VA_i / CE_i$; VA capital employed coefficient for firm i;

$HCE_i = VA_i / HC_i$; human capital coefficient for firm i; and

$SCE_i = SC_i / VA_i$; structured capital coefficient for firm i;

$VA_i = I_i + DP_i + D_i + T_i + M_i + R_i$; VA for firm i computed as the sum of interest expenses (I_i); depreciation expenses (DP_i); dividends (D_i); corporate taxes (T_i); equity of minority shareholders in the net income of subsidiaries (M_i); profits retained for the year (R_i);

CE_i = book value of the net assets for firm i;

HC_i = total expenditure incurred on salaries and wages for firm i;

$SC_i = VA_i - HC_i$; structured capital for firm i

Human Capital is measured through the total expenditure incurred on salaries and wages for the financial year (staff costs) (Pulic 1998). The book value of net assets of a company is measured by the physical capital employed by a company (Mitchell Williams 2000a; Mitchell Williams 2001; Pulic 1998). For the purposes of this article Structural Capital refers to Value Added minus Human Capital. Human Capital and Structural Capital are reverse proportional; the less Human Capital participates in value creation, the more Structural Capital is involved (Pulic 1999).

The use of the above measure is in line with the work of Firer and Mitchell Williams (2003), as the measure is unique in its flexibility in its application to both macro and micro economic levels. The methodology provides a standardised and consistent basis of measurement, thereby enabling national and international comparison. All the data used in the equation are based on audited information; calculations can therefore be considered to be objective and verifiable.

4.4 Independent variables

Gender diversity on the boards of directors was measured as the percentage of female directors on the board of directors of South African companies listed on the JSE Securities Exchange for the year ended 31 December 2003. This approach is consistent with previous research that has questioned the relationship between gender diversity on the board of directors and company performance (see, for example, Bilimoria & Piderit 1994; Coffey & Wang 1998; Judge 2003; Kesner 1988; Mitchell Williams 2000a; Ryan & Haslam 2004). Ethnic diversity was measured as the percentage of directors of colour on the board of directors for South African companies listed on the JSE Securities Exchange for the fiscal year ended 31 December 2003 (see, for example, Cochrane, Wood & Jones 1985; Mitchell Williams 2000a; Westphal & Milton 2000).

4.5 Control factors

The two multiple regression models tested included six control factors. The literature documents various accounting and market-based measures that may be utilised as proxy measures designed to capture the respective properties of the control variables. At present, there is no specific theoretical perspective or empirical evidence supporting any particular proxy measure over another. It was therefore decided for the purposes of the present study to use proxy measures deemed to have been widely used in the existing literature (Firer & Mitchell Williams 2003). Consequently, the proxy measures for each control variable are defined as follows:

Company Size: Total assets

Industry Type: Dummy variables were used to indicate the industries within which companies operated

Risk: Debt to Asset ratio

Productivity: Turnover ratio

Profitability: Return on assets and Return on Equity. Multicollinearity testing was performed on the ROA and ROE ratios, as both use a measure of income to determine a return on the resources used to produce this income. Three principal multicollinearity tests are suggested by Gujarati and Damodar (2003:361): first, a correlation coefficient between the two variables; second, a variable inflation factor (VIF); and last Eigen Values. The correlation coefficient was calculated using Microsoft Excel, and displayed a 7% correlation between the two variables. VIF values were calculated using SPSS software, with all values reflecting less than 10 and therefore no evidence of multicollinearity; and finally Eigen values were calculated using SPSS, where all values were well below the guideline of 100-1000, reflecting no multicollinearity⁵.

5 Results

Descriptive statistics of the key variables are presented in Tables 1 and 2 below:

Table 1 Descriptive statistics

Variable	Mean	Std Deviation	Minimum	Maximum
VAIC TM	3.512	1.031	2.034	8.431
Board size	10.30	3.85	4	31
Percentage of women	0.0645	0.1031	0	0.83
Percentage of ethnic persons	0.13786	0.149	0	1
ROE	21.08453	13.19657	0.59	92.55
ROA	17.8553	7.95782	0.81	40.63
Turnover ratio	7.763761	8.979403	0.18	79.1
Total assets	4572512	7467834	33592	40287930
Debt to asset ratio	1.533077	1.894538	0.06	15.2

Table 2 Descriptive statistics

Variable	Percentage representation on the board of directors	Percentage non-representation on the board of director
Percentage of women	46%	54%
Percentage of ethnic persons	66%	34%

Focusing on the director characteristics of the sample, it was observed that the average number of directors on the boards of directors of South African companies listed on the JSE Securities Exchange for the 2003 fiscal year was 10.3 directors. These findings are consistent with research conducted on 1990s data in the United States of America and in the

⁵ In addition to the multicollinearity tests performed, all multiple regressions were run excluding either ROE or ROA to ensure that there was no multicollinearity effect. Results indicated a decrease in the R² and adjusted R² of between 0.04 and 0.05, with all other variables displaying negligible change and therefore no effect on the overall conclusions reached.

United Kingdom, where the majority of publicly listed companies had 10 or fewer directors on their boards (Conyon & Mallin 1997; Finkelstein & Hambrick 1996; Main & Johnston 1993).

With regard to the presence of women on the boards of South African companies listed on the JSE Securities Exchange for the 2003 fiscal year, the mean percentage of women represented was 6.4%. While 46% of the companies included in the sample had female representation on the board of directors, this is significantly below that reported in developed nations such as the United States, where nearly 75% of boards of directors have women representatives (see, for example, Dalton & Kesner 1985; Daum 1998). These findings are, however, consistent with a study conducted by Mitchell Williams (2000c) using South African data where results indicated that 47% of the sample had female representation on the board of directors. Consistent with findings from other nations, the number of women on boards of directors was usually limited to one or two (see, for example, Daum 1998; Directors and Boards 1992; Karr 1991; Kesner 1988; Von Glinow & Mercer 1988). Indeed, Bilimoria and Piderit (1994) found that, despite the suggested benefits of having women on the boards of directors, women in top leadership positions in the corporate world are rare. Fierman (1990) identified a mere 19 women among the highest-paid officers and directors of the 1000 largest U.S industrial and service companies.

The results indicate that 66% of the companies included in this study had ethnic representation on their boards of directors. This is consistent with the findings of Mitchell Williams (2000c), who found that 64% of the companies had persons of ethnic origin on the board of directors. The mean percentage of ethnic representation on the board of directors in the companies included in the sample in the current study was 13.7%.

This relatively low level of ethnic representation on the boards of South African publicly listed companies for 2003 may be explained by self-categorisation theory and the experience-based argument. Proponents of the self-categorisation theory argue that individuals construct social identities in classifying themselves and others into social categories based on a salient demographic feature such as colour (see, for example, Jackson, Stone & Alvarez 1992; O'Reilly, Williams & Barsade 1997). Proponents of the experience-based argument assert that persons of ethnic origin may be underrepresented due to a lack of experience caused by the effects of apartheid. Through such categorisation, a demographic minority on a board of directors may be considered an out-group by the members of the majority (Westphal & Milton 2000). It is thus suggested that persons of colour may not accept positions on a board of directors where they are considered to be token members and where circumstances are deemed to be unfavourable to them (see, for example, Westphal & Milton 2000; O'Reilly *et al.* 1997).

The results of the regression testing for the significance of women are presented in Table 3. Using Equation One, the regression yielded a positive robust relationship for the coefficients of the control variables ROA, ROE, total assets, debt to asset ratio and turnover ratio. The t-statistics in all cases were above the benchmark level of two. The model fit as measured by the R^2 and adjusted R^2 displayed a model fit for the data at approximately a 60% level. The model therefore has strong predictive ability and results therefore confirmed that the model is stable and adequate as a base for the testing of the hypothesis. Control factors included in the model contributed towards the explanatory power of the model.

The coefficient for women, although displaying a positive relationship, was insignificant as measured by the t-statistic of 1.27. The results therefore rejected the hypothesis that there

is a significant positive relationship between the percentage of women on the board of directors of South African publicly listed companies and company performance. The null hypothesis was therefore accepted.

Table 3 Regression results on the representation of women

Dependent variable: VAIC TM				
Independent variable: Percentage of women on boards of directors				
N			117	
R-squared			0.602433	
Adjusted R-squared			0.572983	
Variable	Coefficient	Std. Error	t-Statistic	Probability
ROA	3.146468	1.050768	2.994445	0.0034
ROE	2.387367	0.629033	3.795299	0.0002
TA	4.63E-08	8.84E-09	5.230155	0.0000
DTA	0.312730	0.088093	3.549990	0.0006
TOR	2.576156	1.009892	2.550922	0.0121
ELECTRONICS	1.978702	0.261976	7.552994	0.0000
RETAIL	1.851630	0.172183	10.75387	0.0000
SERVICE	2.242873	0.207033	10.83341	0.0000
WOMEN	0.950822	0.746294	1.274059	0.2054

The results are consistent with findings by Zald (1969), who concluded that the lack of any relationship was due to the low number of women that were actually on the boards of directors. Bilimoria and Piderit (1994) and Zahra and Stanton (1988) found similar results and attributed the lack of an association between women on the board of directors and company performance to the fact that women are disadvantaged by the type of assignments they are traditionally given whilst on the board of directors.

The results for the regressions testing the significance of ethnic diversity are presented in Table 4. Using Equation Two, the regression yielded positive robust relationships for the coefficients of the control variables ROA, ROE, total assets, debt to asset ratio, turnover ratio, and the industry dummy variables, E, R and S. The t-statistics in all cases were above the benchmark level of two. The model fit as measured by the R² and adjusted R² displayed a model fit for the data at approximately a 62% level. The results therefore confirmed that the model is stable and adequate as a base for the testing of the hypothesis.

The coefficient for ethnic diversity, as measured by the t-statistic of 2.83, was significant, displaying a robust, positive relationship at a 5% level of confidence. The results therefore supported the hypothesis that there is a significant positive relationship between the percentage of colour representatives on the board of directors of South African publicly listed companies and company performance. The null hypothesis was therefore rejected.

Table 4 Regression results on ethnic representation

Dependent variable: VAIC TM				
Independent variable: Percentage of ethnic persons on board of directors				
N			117	
R-squared			0.624412	
Adjusted R-squared			0.596591	
Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROA	3.070886	1.010215	3.039833	0.0030
ROE	2.122975	0.617366	3.438762	0.0008
TA	3.58E-08	9.16E-09	3.909879	0.0002
DTA	0.377099	0.085570	4.406922	0.0000
TOR	3.595024	0.819090	4.389048	0.0000
ELECTRONICS	1.876717	0.257582	7.285888	0.0000
RETAIL	1.817594	0.166209	10.93562	0.0000
SERVICE	2.178673	0.200019	10.89234	0.0000
ETHNIC	1.061920	0.374547	2.835208	0.0055

The results confirm those of various other studies (see, for example, Crano & Chen 1998; Hitt & Barr 1989; Nemeth 1986). Laughlin (1992), Moscovici and Faucheaux (1972) and Nemeth (1986) suggest that the addition of a person adding ethnic variety to a board of directors will assist in offering unique perceptions on issues that can alter the conventional views of the board of directors by encouraging others to question the assumptions that had previously implicitly guided the reasoning of the board.

6 Conclusions and suggestions for future research

This study identified a link between the percentage of people of ethnic origin on the boards of directors of South African publicly listed companies and intellectual capital performance. This connection was empirically supported by the evidence that there is a positive relationship between ethnic diversity on the board of directors and intellectual capital performance. These results are extremely positive within the South African context. The previous government systematically and purposely restricted the black members of South African society from meaningful participation in the economy. In the ten years since the abolition of apartheid, the South African economy has experienced consistent economic growth and macroeconomic stabilisation. South Africa's constitution has enshrined the right of all South Africans to equality and provided for specific measures to be taken to redress historical imbalances (Department of Trade and Industry 2003). New legislation aims to address the inequalities created by the previous government, and transform society in all areas. Some of the legislation introduced includes the Employment Equity Act (South Africa 1998), the Promotion and Prevention of Unfair Discrimination Act (2000) and the National Small Business Act (1996). The Employment Equity Act outlaws all forms of unfair discrimination at work and requires companies to take affirmative action steps to bring about a representative spread of designated groups in all occupations and at all organisational levels (Department of Trade and Industry 2003). This would include the appointment of black people to leadership positions. The results of this study indicate that

South African business has progressed towards economic and social transformation and that transformation has been effective in contributing towards company performance.

6.1 *Limitations and suggestions for future research*

The findings of the present study are subject to limitations that provide initiatives for future research. One possible reason for the mixed results may be that the classification of women or persons of ethnic origin in terms of whether they hold executive or non-executive positions on the board was not analysed. The lack of a clear relationship between women's being on the board of directors and a firm's performance may be attributed to the type of assignments and tasks given to these members when they serve on a board of directors. The focus of this study was whether the addition, *per se*, of women or persons of ethnic origin to a board of directors contributed towards intellectual capital performance and not whether the contribution was a function of the position held. A future study could explore the relationship between women and ethnic persons and the specific positions they hold on the board and company performance.

Another possible reason for the mixed results may be that the variables of the presence of women or persons of ethnic origin were operationalised simply as the percentage of women or persons of ethnic origin on the board of a given company. This measure does not take into account changes in the number of women or ethnic persons on the board of a given company and the date of their appointment or the length of their service. Future studies could examine the relationship between intellectual capital performance and alternative board characteristics such as the overall board size, the educational qualifications or occupational experience of directors and the date of appointment or length of service of directors appointed to the board.

The focus of this study was to analyse the relationship between board diversity and intellectual capital performance during a single time period. Future studies could use the same basic hypotheses and regression construction, but might implement the study as a longitudinal study rather than as a cross-sectional design. A longitudinal study would need to correct changes in data relative to timed element such as price inflation.

This article has examined the relationship between board structure and intellectual capital within an isolated corporate governance setting. This study could be extended to consider nations with a different corporate governance structure to that prevalent in South Africa.

Despite the possible limitations of using single-period data, a relatively focused sample, operationalised board characteristics, and a single domestic location, it is believed that the results of the present study provide valuable insights into the relationship between board structure and intellectual capital performance.

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