An investigation into the use of derivatives by the 2nd 100 largest listed companies in South Africa

Presented in the partial fulfilment of the requirements for the Masters degree in Financial Management

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Anti plagiarism declaration

I confirm that the report below is my own work unless otherwise stated and that the references used below are an accurate reflection of the sources of the information reflected.

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2. Introduction

The South African Companies Act No. 61 of 1973 requires that companies present financial information in their Annual Financial Reports in accordance with South African Generally Accepted Accounting Practices (SA GAAP). The revised Companies Act 71 of 2008 S29 (4) (b) requires *"in the case of financial reporting standards, must be consistent with the International Financial Reporting Standards "IFRS" of the International Accounting Standards Board or its successor body"*

Listed companies in South Africa must comply with the requirements of IFRS and International Accounting Standards "IAS" (Section 8, JSE Listings Requirements).

It is as a result of the above and the issuance of International Financial Reporting Standard 7 Financial Instruments Disclosures, the subsequent amendment to IFRS 7 effective for periods beginning on or after 1 January 2009 and the JSE rules that require all listed companies to have a copy of their annual financial statements available at their registered office that we are now able to establish from a review of listed companies AFS (Annual Financial Statements) or for recently listed companies a review of the prospectus to determine the extent of the use of derivatives by listed companies.

This is particularly relevant given the recent global economic crisis and failures by companies as a result of speculating in derivatives e.g. AIG, which had to be bailed out.

This is the reason why I have included myself in a group of researchers who have embarked on a project to establish how many of South Africa's companies listed on the main Johannesburg Stock Exchange Board and the Alternative Exchange are using derivatives (including share options) and to what extent, what has been the resultant effect on their profit or loss and how does this compare when we put these companies into sectors.

My **research question** is: "An investigation into the use of derivatives by the 2nd 100 largest listed companies in South Africa" as this is where I have been positioned in the group that is undertaking this research. I will endeavor through this research report to

establish not only which companies are using derivatives but through a review of the Annual Financial Statements "AFS" also the reason for the use of derivatives whether only to hedge against for example market risk or whether the companies are using derivatives to speculate.

I will also compare the use of derivatives by this subset of South African companies with other studies including those with medium or large companies.

I will review the current accounting standards to understand and outline the requirements for these companies. I will also summarise a sample of the previously published papers internationally which delved into a similar topic.

3. Structure of the Paper

Having discussed the background to the research question the remainder of the paper consists of the literature review, the sample and data, the methodology and results of the study, the findings and the conclusion. The appendices follow after the list of references used in the paper.

Literature Review

3.1 History of financial reporting standards

With effect from 2005 listed companies were required under the JSE Securities Listing requirements to comply with IFRS's. Fortunately for South Africa the South African Institute of Chartered Accountants "SAICA" had implemented a harmonization program previously which resulted in South African Statements of Generally Accepted Accounting Practice (GAAP) being based on International Accounting Standards and therefore GAAP was similar to IFRS at the transition date. The International Accounting Standards Board ("IASB") further issued IFRS 1 "First Time adoptions of International Financial Reporting Standards" which assisted and outlined the process for companies to make the transition from SA GAAP to IFRS with the most significant impact being the retrospective adoption of IFRS and the preparation of a 2004 balance sheet using IFRS principles. There were also ten exemptions that were permitted on first time adoption of IFRS and four compulsory exemptions e.g. no retrospective application of IFRS 2 Share based payments would only apply to companies who granted share options prior to 1 January 2005 and such options had not vested. The extent and implications of these ten exemptions are outside the scope of this paper.

SAICA also issued Circular 07/2004 which grouped the differences between SA GAAP and IFRS into the following categories:

1. Standards that have substantially improved as a result of the IASB's improvement project.
2. Revised Standards e.g. IAS 38 Intangible Assets (previously AC129) which required intangible assets with indefinite useful lives to be tested for impairment annually versus amortised.
3. Aligned standards which required the modification of the SA GAAP standard to align with the equivalent International Accounting Standard.
4. New standards – these were new accounting standards that never existed in SA GAAP e.g. IFRS 2 "share based payments"
5. Replacement standards, these were for standards that were replaced in their entirety e.g. AC131 (IAS 22) replaced by IFRS 3 – Business Combinations.

So in summary the adoption of IFRS caused quite a bit of upheaval in the accounting and auditing profession due to the administration, the increased audit fees and the implementation of the revised requirements to accounting system but in hindsight it was a bit of a storm in a tea cup compared to the changes to IAS 39 financial instruments and the subsequent impact on companies balance sheets as a result of fair value reporting and also the increased understanding of the risks of trading in certain financial instruments that was clarified with the introduction of IFRS 7 and the subsequent amendments. Refer below for summaries of these standards.

3.2 The following International Financial reporting standards applicable to derivatives:

- IFRS 2 Share based payments
- IFRS 7 Financial Instruments Disclosure
- IFRS 9 Financial Instruments
- IAS 32 Financial Instruments Presentation
- IAS 39 Financial Instruments: Recognition and Measurement

I have summarized / extracted with the help of the *International Financial Reporting Standards* issued by the International Accounting Standards Board for 2010 as well as "Nkonki's Quick Reference Guide to IFRS 2010" published in 2010 the applicable texts from the standards which are most relevant to the understanding of the accounting requirements related to financial instruments. The information in italics is a direct extract from the IFRS and the information in the Times New Roman font was quoted directly from Nkonki's guide.

IFRS 2 Share based payments

Objective

"The objective of this IFRS is to specify the financial reporting by an entity when it undertakes a share based payment transaction. In particular, it requires an entity to reflect in its profit or loss and financial position the effects of share based payment transactions, including expenses associated with transactions in which share option are granted to employees.

Scope

An entity shall apply this IFRS in accounting for all share-based payment transactions, whether or not the entity can identify specifically some of all of the goods or services received, including:

a) *Equity settled share based payment transactions,*
b) *Cash settled share based payment transactions; and*
c) *Transactions in which an entity receives or acquires goods or services and the terms of the arrangement provide either the entity or the supplier of those goods or services with a choice of whether the entity settles the transaction in cash or by issuing equity instruments.*

Recognition

An entity shall recognize the goods or services received or acquired in a share-based payment transaction when it obtains the goods or as the services are received. The entity shall recognize a corresponding increase in equity if the goods or services were received in an equity-settled share based payment transaction or a liability if the goods or services were acquired in a cash-settled share-based payment transaction.

When goods or services received or acquired in a share-based payment transaction do not qualify for recognition as assets, they shall be recognised as expenses.

Measurement

For equity-settled share based payment transactions the entity shall measure the goods or services received, and the corresponding increase in equity, directly, at the fair value of the goods or services received, unless that fair value cannot be estimated reliably. If the entity cannot estimate reliably the fair value of the goods or services received, the entity shall measure their fair value, and the corresponding increase in equity, indirectly by reference to the fair value of the equity instruments granted.

For cash-settled share-based payment transactions, the entity shall measure the goods or services acquired and the liability incurred at the fair value of the liability. Until the liability is settled, the entity shall re-measure the fair value of the liability at the end of each reporting

period and at the date of settlement, with any changes in fair value recognized in profit or loss for the period.

Disclosures

An entity shall disclose information that enables users of the financial statements to understand the nature and extent of share-based payment arrangements that existed during the period.

IFRS 7 Financial Instruments: Disclosure

The objective of the IFRS is to require entities to provide disclosures in their financial statements that enable users to evaluate:

a) *The significance of financial instruments for the entity's financial position and performance; and*
b) *The nature and extent of risks arising from financial instruments to which an entity is exposed during the period and at the end of the reporting period, and how the entity manages those risks.*

When this IFRS requires disclosures by class of financial instrument, an entity shall group financial instruments into classes that are appropriate to the nature of the information disclosed and that take into account the characteristics of those financial instruments. An entity shall provide sufficient information to permit reconciliation to the line items presented in the statement of financial position.

The principles in this IFRS complement the principles for recognizing, measuring and presenting financial assets and liabilities in IAS 32 Financial Instruments: Presentation and IAS 39 Financial Instruments: Recognition and Measurement.

IFRS 9 Financial Instruments

Objective

The objective of this IFRS is to establish principles for the financial reporting of financial assets that will present relevant and useful information to users of financial statements for their assessment of the amounts, timing and uncertainty of an entity's future cash flows.

Recognition

An entity shall recognize a financial asset in its statement of financial position when, and only when the entity becomes party to the contractual provisions of the instrument.

Classification

An entity shall classify financial assets as subsequently measured at amortised cost or fair value on the basis of both:

(a) The entity's business model for managing the financial assets; and

(b) The contractual cash flow characteristics of the financial assets

Measurement

At initial recognition, an entity shall measure a financial asset at its fair value plus, in the case of a financial asset not at fair value through profit or loss, transaction costs that are directly attributable to the acquisition of the financial asset.

Subsequent to initial recognition, an entity shall measure a financial asset at fair value or amortised cost.

Note this standard is only effective for annual periods beginning on or after 1 January 2013.

IAS 32 Financial Instruments: Presentation

The objective of this standard is to establish principles for presenting financial instruments as liabilities or equity and for offsetting financial assets and liabilities. It applies to the classification of financial instruments, from the perspective of the issuer, into financial assets, financial liabilities and equity instruments; the classification of related interest, dividend, losses, and gains; and the circumstances in which financial assets and financial liabilities should be offset.

The principles in this Standard complement the principles for recognizing and measuring financial assets and financial liabilities in IAS 39 Financial Instruments: Recognition and Measurement, and for disclosing information about them in IFRS 7 Financial Instruments: Disclosures.

The issuer of financial instruments shall classify the instrument, or its component parts, on initial recognition as a financial liability, a financial asset or an equity instrument in accordance with the substance of the contractual arrangement and the definitions of a financial liability, a financial asset and an equity instrument.

A financial asset is any asset that is:

a) *Cash,*
b) *An equity instrument of another entity;*
c) *A contractual right:*
    a. *To receive cash or another financial asset from another entity; or*
    b. *To exchange financial assets or financial liabilities with another entity under conditions that are potentially favorable to the entity; or*
d) *A contract that will or may be settled in the entity's own equity instruments and is*
    (i) *A non-derivative for the which the entity is or may be obliged to receive a variable number of the entity's own equity instruments; or*
    (ii) *A derivative that will or may be settled other than by the exchange of a fixed amount of cash or another financial asset for a fixed number of the entity's equity instruments. For this purpose the entity's equity instruments do not include puttable financial instruments classified as equity instruments in accordance with paragraphs 16A and 16B of IAS 32, instruments that impose on the entity an obligation to deliver to another party a pro rata share of the net assets of the entity only on liquidation and are classified as equity instruments in accordance with paragraphs 16C and 16D of IAS 32, or instruments that are contracts for the future receipt or delivery of the entity's own equity instruments.*

A financial liability is any liability that is:

a) *A contractual obligation:*
    a. *To deliver cash or another financial asset to another entity; or*
    b. *To exchange financial assets or financial liabilities with another entity under conditions that are potentially unfavorable to the entity; or*
b) *A contract that will or may be settled in the entity's own equity instruments and is:*
    a. *A non-derivative for which the entity is or may be obliged to deliver a variable*

number of the entity's own equity instruments; or

b. *A derivative that will or may be settled other than by the exchange of a fixed amount of cash or another financial asset for a fixed number of the entity's own equity instruments. For this purpose the entity own equity instruments do not include puttable instruments that are classified as equity instruments in accordance with paragraphs 16A and 16B of IAS 32, instruments that impose on the entity an obligation to deliver to another party a pro rata share of the net assets of the entity only on liquidation and are classified as equity instruments in accordance with paragraphs 16C and 16D of IAS 32, or instruments that are contracts for the future receipt or delivery of the entity's own equity instrument*

As an exception, an instrument that meets the definition of a financial liability is classified as an equity instrument if it has all the features and meets the conditions in paragraphs 16A and 16B of IAS 32 or paragraphs 16C and 16D of IAS 32.

An equity instrument is any contract that evidences a residual interest in the assets of an entity after deducting all of its liabilities.

Fair value is the amount for which an asset could be exchanged, or a liability settled, between knowledgeable, willing parties in an arm's length transaction.

A puttable instrument is a financial instrument that gives the holder the right to put the instrument back to the issuer for cash or another financial asset or is automatically put back to the issuer on the occurrence of an uncertain future event or the death or retirement of the instrument holder.

Offsetting a financial asset and a financial liability (Extracted from Nkonki publication)

A financial asset and a financial liability shall be offset and the net amount presented in the statement of financial position when and only when, an entity:

(a) Currently has a legally enforceable right to set off the recognized amounts, and

(b) Intends either to settle on a net basis, or to realize the asset and settle the liability simultaneously.

IAS 39 Financial Instruments: Recognition and Measurement (Extracts from the Standard)

The objective of this standard is to establish principles for recognizing and measuring financial assets, financial liabilities and some contracts to buy or sell non-financial items. Requirements for presenting information about financial instruments are in IAS 32 Financial Instruments: Presentation. Requirements for disclosing information about financial instruments are in IFRS 7 Financial Instruments: Disclosures (see summaries above).

Classification (Extracted from Nkonki's publication)

This standard classifies financial instruments into the following four categories:

a) A financial asset or financial liability at fair value through profit or loss
b) Held to maturity investments
c) Loans and Receivables
d) Available for sale financial assets

An amendment issued to the standard, issued In June 2005, permits an entity to designate a financial asset or financial liability (or a group of financial assets, financial liabilities or both) on initial recognition as one(s) to be measured at fair value, with changes in fair value recognized in profit or loss. To impose discipline on this categorization, an entity is precluded from reclassifying financial instruments into or out of this category.

Reclassifications

An amendment to this standard issued in October 2008, permits an entity to reclassify non-derivative financial assets (other than those designated at fair value through profit or loss by the entity upon initial recognition) out of the fair value through profit or loss category in particular circumstances. The amendment also permits an entity to transfer from the available for sale category to the loans and receivables category a financial asset that would have met the definition of loans and receivables (if the financial asset had not been designated as available for sale), if the entity has the intention and the ability to hold that financial asset for the foresee able future.

Initial Recognition (From the Standard)

An entity shall recognise a financial asset or a financial liability in its statement of financial position, when, and only when, the entity becomes a party to the contractual provisions of the instrument.

Initial measurement of financial assets and financial liabilities (Extracted from Nkonki's publication)

When a financial asset or a financial liability is recognized initially, an entity shall measure it at its fair value plus, in the case of a financial asset or a financial liability not at fair value through profit or loss, transaction costs that are directly attributable to the acquisition or issue of the financial asset or financial liability. Fair value is the amount for which an asset could be exchanged, or a liability settled, between knowledgeable, willing parties in an arm's length transaction.

Subsequent measurement of financial assets

For the purpose of measuring a financial asset after initial recognition, this standard classifies financial assets into the following four categories defined in paragraph 9 of IAS 39:

a) Financial assets at fair value through profit or loss;
b) Held-to-maturity investments
c) Loans and Receivables; and
d) Available-for-sale financial assets

After initial recognition, an entity shall measure financial assets, including derivatives that are assets, at their fair values, without any deduction for transaction costs it may incur on sale or other disposal, except for the following financial assets:

a) Loans and receivables as defined in paragraph 9 of IAS 39, which shall be measured at amortized cost using the effective interest method
b) Held to maturity investments as defined in paragraph 9 of IAS 39, which shall be measured at amortized cost using the effective interest rate method
c) Investments in equity instruments that do not have a quoted market price in an active market and whose fair value cannot be reliably measured and derivatives that are linked to and must be settled by

delivery of such unquoted equity instruments, which shall be measured at cost (see Appendix A paragraphs Application Guidance "AG"80 and AG81 of IAS 39).

Financial assets that are designated as hedged items are subject to measurement under hedge accounting requirements in paragraphs 89 – 102 of IAS 39. All financial assets except those measured at fair value through profit or loss are subject to review for impairment in accordance with paragraphs 58 – 70 of IAS 39 and Appendix A paragraphs AG84 – AG93 of IAS 39.

Impairment and uncollectibility of financial assets (From the standard)

An entity shall assess at the end of each reporting period whether there is objective evidence that a financial asset or group of financial assets is impaired.

Subsequent measurement of financial liabilities

After initial recognition, an entity shall measure all financial liabilities at amortized cost using the effective interest rate method, except for:

a) *Financial liabilities at fair value through profit or loss. Such liabilities including derivatives that are liabilities shall be measured at fair value except for a derivative liability that is linked to and must be settled by delivery or an unquoted equity instrument whose fair value cannot be reliably measured, which shall be measured at cost.*
b) *Financial liabilities that arise when a transfer of a financial asset does not qualify for de-recognition or when the continuing involvement approach applies. Paragraphs 29 and 31 apply to the measurement of such financial liabilities.*
c) *Financial guarantee contracts as defined in paragraph 9 of IAS 39. After initial recognition, an issuer of such a contract shall (unless paragraph 47(a) or (b) of IAS 39 applies) measure it at the higher of :*
    a. *The amount determined in accordance with IAS37 Provisions, Contingent Liabilities and Contingent Assets; and*
    b. *The amount initially recognized (see paragraph 43 of IAS 39) less, when appropriate, cumulative amortization recognized in accordance with IAS 18 Revenue.*
d) *Commitments to provide a loan at a below market interest rate.*
    After initial recognition, an issuer of such commitment shall (unless paragraph 47(a) applies) measure it at the higher of:
    a) The amount determined in accordance with IAS 37; and

b) The amount initially recognized (see paragraph 43) less, when appropriate, cumulative amortization recognized in accordance with IAS 18

De-recognition of a financial liability

An entity shall remove a financial liability (or part of a financial liability) from its statement of financial position when, and only when, it is extinguished – i.e. when the obligation specified in the contract is discharged or cancelled or expired.

De-recognition of a financial asset

De-recognition of financial assets is not permitted to the extent to which the transferor has retained (1) substantially all the risks and rewards of the transferred assets or part of the asset, or (2) control of an asset or part of an asset for which it has neither retained nor transferred substantially all risks and rewards.

Gains and Losses

A gain or loss arising from a change in the fair value of a financial asset or financial liability that is not part of a hedging relationship shall be recognized, as follows.

a) A gain or loss on a financial asset or financial liability classified as at fair value through profit or loss shall be recognized in profit or loss.
b) A gain or loss on an available for sale financial asset shall be recognized in other comprehensive income except for impairment losses and foreign exchange gains and losses, until the financial asset is derecognized. At that time the cumulative gain or loss previously recognized in other comprehensive income shall be reclassified from equity to profit or loss as a reclassification adjustment. However, interest calculated using the effective interest rate method is recognized in profit or loss. Dividends on an available-for-sale equity instrument are recognized in profit or loss when the entity's right to receive payment is established.

For financial assets and financial liabilities carried at amortized cost a gain or loss is recognized in profit or loss when the financial asset or financial liability is derecognized or impaired, and through the amortization process. However, for financial assets or financial liabilities that are hedged items the accounting for the gain or loss shall follow paragraphs 89 – 102.

Hedging

If there is a designated hedging relationship between a hedging instrument and a hedged item as described in paragraphs 85 – 88 of IAS 39 and Appendix A paragraphs AG102 – AG 104 of IAS 39, accounting for the gain or loss on the hedging instrument and the hedged item shall follow paragraphs 89-102 of IAS 39.

Hedging relationships are of three types:

a) Fair value hedge: a hedge of the exposure to changes in fair value of a recognized asset or liability or an unrecognized firm commitment, or an identified portion of such an asset, liability or firm commitment that his attributable to a particular risk and could affect profit or loss.
b) Cash flow hedge: a hedge of the exposure to variability in cash flows that (i) is attributable to a particular risk associated with a recognized asset or liability (such as all or some future interest payments on variable rate debt) or a highly probable forecast transaction and (ii) could affect profit or loss.
c) Hedge of a net investment in a foreign operation as defined in IAS 21.

If a fair value hedge meets the conditions in paragraph 88 of IAS 39 during the period, it shall be account for as follows:

a) The gain or loss from re-measuring the hedging instrument at fair value (for a derivative hedging instrument) or the foreign currency component of its carrying amount measured in accordance with IAS 21 (for a non-derivative hedging instrument) shall be recognized in profit or loss; and
b) The gain or loss on the hedged items attributable to the hedged risk shall adjust the carrying amount of the hedged item and be recognized in profit or loss. This applies if the hedged item is otherwise measured at cost. Recognition of the gain or loss attributable to the hedged risk in profit or loss applies if the hedged item is an available for sale financial asset.

If a cash flow hedge meets the conditions in paragraphs 88 during the period, it shall be accounted for as follows:

a) The portion of the gain or loss on the hedging instrument that is determined to be an effective hedge (see paragraph 88) shall be recognized in other comprehensive income; and
b) The ineffective portion of the gain or loss on the hedging instrument shall be recognized in profit or loss.

Hedges of a net investment in a foreign operation, including a hedge of a monetary item that is accounted for as part of a net investment (see IAS 21), shall be accounted for similarly to cash flow hedges.

a) The portion of the gain or loss on the hedging instrument that is determined to be an effective hedge

(see paragraph 88) shall be recognized in other comprehensive income; and

b) The ineffective portion shall be recognized in profit or loss.

This concludes the section on the summary of the IFRS relevant to this research report, I will now proceed to review a sample of the literature currently available from other countries exploring the use of derivatives as follows: Sweden, US, Germany, Dutch firms, Belgium, UK, New Zealand, Hong Kong and Brazil. See attached references for the reports used.

3.3 Review of prior surveys

Philips, A.L., (1995) published a survey conducted by the Treasury Management Association (TMA) in the USA of its members use of derivatives. Of the 3480 surveys sent out, 657 returned the completed questionnaire (18.9%), 415 (63.2%) responded that they used derivatives. Of the 63.2% that used derivatives, 70.8% reported that they used derivatives for financial risk management, 66.7% use derivatives to secure funding and 21.4% reportedly used derivatives for investment purposes.

The study also gauged the respondent's perception to their exposure which revealed the following, 90.4% are exposed to interest rate risk, 75.4% interest rate risk and 36.6% to commodity price risk. Interesting to note is that 3.1% of the sample were exposed to no risk and 30.8% were exposed to all three types of risks. The majority of firms where the trading in derivatives was motivated by investment purposes were less than $1 billion in size by market capitalization and the main two types of derivative assets invested in were asset backed securities and securities with embedded options.

Bodnar, G.M., Hayt, G.S., Marston, RC. And Smithson, C.W., (1995) performed a survey of non-financial firms in the US which included a population of 2000 firms across 40 Industries. A response rate of 26.5% was received (530). The findings were that 65% of the sample of large non-financial firms used derivatives while only 13% of small non-financial firms used derivatives. The various sector results were as follows, agriculture, refining and mining 50% of firms that responded used derivatives, 40% for manufacturing industries, 32% for transportation and regulated industries, retail and wholesale 29% and other services 13%.

Conclusion, derivative usage is still not that widespread, especially amongst smaller firms and derivatives are not commonly used to speculate on market movements.

Bodnar, G.M., Hayt, G.S. and Marston, R.C., (1996) performed a survey on non-financial firms in the US and their use of derivatives with a particular emphasis on the valuation and risk measurement issues. 350 firms responded to the survey for which the population included the 2000 firms included in the 1994 survey (published 1995) and the balance of the Fortune 500 not included in the 1994 survey. The responses were classified into the following categories, 176 from the manufacturing sector, 77 from the primary products sector and 97 from the services sector.

The results are as follows for the large firms 59% use derivatives, 48% for medium firms and 13% for small firms. In terms of industry classification 48% was for the primary product producers, 44% for manufacturers and 29% for firms in the services sector.

Grant, K. and Marshall, A.P., (1997) performed a survey of the largest UK firms (FTSE 250), the largest UK companies and found that the majority of the firms were users of derivatives. At the time of the survey there was no requirement for UK companies to mark to market derivatives. Equity and commodity price risk were not commonly hedged by using derivatives and derivatives were not being used to speculate. The use of exotic derivatives was limited due to the lack of knowledge by boards of directors however this was expected to increase with time.

Berkman, H., Bradbury, M.E. and Magan, S., (1997) compared the results of a survey of 79 New Zealand non financial firms to earlier US financial management surveys.

Conclusion, New Zealand firms were more active derivative users (relative to their size) and had more comprehensive reporting systems when compared to their US counterparts. However only 7% of the New Zealand firm's selected used commodity price derivatives to manage commodity-price exposure, compared to 37% in the US (Bodnar et al, 1995). New Zealand firms report more frequently on their derivative positions to their boards of directors than US non financial firms.

Bodnar, G.M., Hayt, G.S. and Marston, R.C., (1998) the survey was sent to the same sample as the 1994 and 1995 surveys and a total of 399 non-financial US companies responded i.e. 197 from the manufacturing sector, 82 from the primary products sector and 120 from the services sector. 50% of the firms in the sample responded that they used derivatives.

Summary, the use of derivatives was not widespread i.e. only 50% of firms however the intensity of derivative usage appeared to be increasing. Derivatives usage was ranked as follows in order of volumes of usage, foreign currency derivatives, interest rate derivatives, commodity price derivatives and equity derivatives which is consistent with the surveys referenced in the rest of this paper.

Bodnar, G.M. and Gerbhardt, G., (1999) did a comparative study of the 1995 Wharton school survey on US non financial firms and the companion study done in 1997 on German non-financial firms.

It was not a straight comparison but rather the author's created sub-samples of the individual studies to ensure comparability by both size and industry composition. The finding was that German firms (78%) were more likely to use derivatives than their US counterparts (57%). This is across all three classes which for both countries ranked as follows in terms of the value of derivatives used, 1 foreign currency derivatives, 2 interest rate derivatives followed thirdly by commodity price derivatives.

Both samples for the individual country's firms indicated that they used derivatives primarily for risk management however differences appear in the primary goal of using derivatives, US firms focused on managing cash flows whereas German firms focused on managing accounting results.

Bodnar, G.M., Hayt, G.S., Marston, R.C and Macrae, V., (1999) performed a survey to establish the impact of institutional differences on corporate risk management practices in the USA and the Netherlands. The comparison was made between the 1998 Wharton survey of 399 non-financial US firms (note only 267 were eventually used for this survey) and 84 Dutch firms for a survey also performed in 1998.

The finding was that Dutch firms use derivatives more often than US firms across all sizes and industry classes to manage financial risk. The difference between the two countries in the use of derivatives is not significant and the primary reason for the difference between the two countries in usage was not institutional differences but rather broad economic phenomena.

Alkeback, P. and Hagelin, N. **(1999)** performed two surveys, one in 1999 and one in 2006 covering the derivatives usage by non-financial firms in **Sweden**. The survey was compared to a similar study performed in the USA by Bodner (see above) and in New Zealand by Berkman.

In the 1999 survey the results revealed that 52% of non-financial firms in Sweden used derivatives compared to 53% in New Zealand and 39% in the USA. The use of derivatives was more prevalent amongst larger firms and the purpose of the derivatives was more for hedging purposes. It was more the larger firms that used derivatives for speculative purposes. The issue that concerned most directors was the lack of knowledge regarding derivatives although this was the issue of least concern in the USA.

The conclusion of the paper was that the driving factor of the use of derivatives was economic and not cultural differences i.e. Sweden at the time had a small open economy with a large amount of importing and exporting and a higher exposure to foreign exchange risk compared to the USA and Sweden had a history of a volatile interest rate. These differences did not necessarily exist between Sweden and New Zealand although Sweden had a history of spending more money on Research and Development (one of the highest as a percentage of GDP) than New Zealand (one of the lowest).

De Ceuster, M.J.K., Durinck, E., Lavern, E. and Lodewyckx, J., (2000) performed a survey of large non-financial firms in Belgium. The focus in Belgium was on constraining the volatility of earnings versus managing cash flows as in the US.

Of the 73 respondents, 48 used derivatives (65.8%), 16 had never used derivatives and nine had stopped using derivatives. Where the firms did not use derivatives the main reason was company policy restrictions.

Prevost, A.K., Rose, LC., and Miller, G (2000) performed a survey to determine the use of off balance sheet risk management instruments in New Zealand. 155 companies responded from the initial sample of 334 which included the top 200 public and private New Zealand companies. Of the 155 firms, 104 (67.1%) report that they used derivatives whereas 51 (32.9%) did not.

Consistent with the rest of the surveys performed for other countries the finding was that the larger firms used derivatives however inconsistent with previous surveys the finding was that a significant number i.e. greater than 50% of smaller firms also used derivatives. The highest user of derivatives by sector was the utilities and communications industry (80%), then chemicals at 75% with insurance and energy firms reporting that 67% used derivatives.

The use of derivatives to manage foreign exchange risk since the 1997 Bodnar survey had remained relatively unchanged whereas the use of derivatives to manage interest rate risk had increased significantly from 44% to 70%.

The most important factor cited for the use of derivatives was the protection of the balance sheet (51%) management of cash flow risk (47.1%) (single most important reason) and thirdly the management of fluctuations in accounting earnings (35.6%). Nearly 70% of the firms in the survey occasionally used derivatives to manage funding costs.

Malin, C., Ow-Yong, K. and Reynolds, M., (2001) performed a survey of the derivatives usage by 231 non-financial UK companies, 60% of whom reported that they used at least one derivative. The primary motive for using derivatives was the managing of accounting earnings. The primary concern of financial directors was the ability to value derivatives and the transaction costs incurred.

The finding was that the use of derivatives to hedge financial price risk was well established in the larger companies in the UK. The other finding which agrees with other studies mentioned is that larger companies were more likely to use derivatives than smaller companies i.e. 100% of companies sampled with a turnover greater than GBP 100 million used derivatives whereas small firms, turnover up to GBP 10 million only 29% use derivatives. The main reason cited for not using derivatives was lack of exposure to risk. The issue that most concerned financial

directors was the ability to evaluate the risk associated with using derivatives.

Bodnar, G.M., Hayt, de Jong, A and Macrae, V., (2003) performed a survey to establish the impact of institutional differences on corporate risk management practices in the USA and the Netherlands. The comparison was made between the 1998 Wharton survey of 399 non-financial US firms (note only 267 were eventually used for this survey) and 84 Dutch firms for a survey also performed in 1998.

The finding was that Dutch firms used derivatives more often than US firms across all sizes and industry classes to manage financial risk. The difference between the two countries in the use of derivatives was not significant and the primary reason for the difference between the two countries in usage was not institutional differences but rather broad economic phenomena.

The **2006 paper** by the same authors attempted to establish if there was any change in the use of derivatives in the intervening seven year period between the 1996 survey and 2003, a seven year period.

The finding was that 59% of Swedish firms used derivatives compared to 52% in 1996. There was also a marked increase in the use of derivatives by small (18% in 1996 vs. 34% in 2003) and medium firms (43% in 1996 vs. 68% in 2003) compared to 1996 and the hedging of the balance sheet by Sweden was higher than for other firms albeit lower than in the 1996 survey. The concern regarding a lack of knowledge about derivatives had also diminished significantly compared to the 1996 survey.

Consistent with the 1996 survey it was the larger firms that used derivatives for speculative purposes i.e. 38% of the sample of large firms compared to 18% for small firms.

The conclusion of the paper was that there was an increase in the use of derivatives amongst the small to medium firms as mentioned above and that the lack of knowledge around derivatives was no longer an issue, rather financial directors were more concerned about accounting treatment, liquidity risk and transactional costs.

El-Masry, A.A., (2006) conducted a survey of 401 UK non-financial firms. The findings were

that larger firms were more likely to use derivatives than medium and small firms and public firms were more likely to use derivative than private firms. The biggest user of derivatives was the international firms. Half of the firms did not use derivatives because their exposure was insignificant and the most important reason for not using derivatives was the onerous disclosure requirements from the FASB and also the fact that the cost of establishing and maintaining derivatives programs exceeded the benefits.

As with the studies above the most important risk hedged with derivatives is foreign exchange with the second most important being interest rate risk. The motive for using derivatives was to manage cash flow volatility.

Sheedy, E., (2006) performed a survey on Hong Kong and Singapore with a view to better understanding risk management practices. The findings were that derivatives were used more extensively in Singapore and Hong Kong compared to the US. Similar to previous surveys for other countries the primary use was to manage foreign exchange risk.

Unlike the surveys for the US, the speculative motive was higher. Despite the aforementioned increase in speculative motive there still appeared to be a lack of controls and management oversight. The sample consisted of 131 firms based in Hong Kong and Singapore, more medium and smaller sized firms compared to the Wharton survey and skewed towards the services sector. The reason for the high use of derivatives was attributed to the high foreign denominated revenue, costs and debt.

Bartram, S.M., Brown, G.W., and Fehle, F., (2009) published a paper in 2009 wherein they examined foreign exchange, interest rate, and commodity price derivatives held by 7319 companies in 50 countries, including the United States. The sample covered about 80% of the global market capitalization of non-financial firms.

More than 60.3% of the sample selected above used some sort of derivative. Most common was the use of foreign exchange rate derivatives (45.2%), second is interest rate derivatives, with commodity based derivatives a distant third (10%).

Usage rates were highest in the utility and chemical industries and lowest in the consumer

goods and miscellaneous mostly services industries. The Japanese most commonly used foreign exchange and interest rate derivatives and used slightly less commodity price derivatives than the typical firm. Commodity price derivatives were concentrated in the following industries oil, mining, steel and chemicals. The use of interest rate derivatives differed across industries as follows, utilities (61.7%) and mining the lowest (20.3%). Foreign exchange rate derivatives usage is somewhat uniform with the rates across industries being between 36% and 69%.

Conclusion, general derivative users had higher leverage and income tax credits and lower quick ratios and less intangible assets. Hedgers were larger and more profitable and had longer debt maturity and higher interest cover ratios. Derivatives usage was significantly related to debt maturity, leverage, holding of liquid assets, debt maturity, dividend policy and operational hedges. Firms with less liquid derivative markets were less likely to hedge e.g. middle income countries.

Jose Luiz and Rossi Junior published a paper called "The Use of Currency Derivatives by Brazilian Companies: An Empirical Investigation." The purpose of the paper was to study the use of foreign currency derivatives for a sample of non-financial companies from 1996 to 2004
The paper also proves that for the sample selected there is evidence that the macroeconomic environment and country specific factors not analysed in previous empirical work also played a role in determining risk management practices and that the use of currency derivatives impacts on company's decisions regarding capital structure and the currency composition of their debt.

What makes this survey particularly interesting is that during the period surveyed (1996 – 2004) Brazil suffered two main exchange rate crises (one took place in 1999 and the second in 2002) which made the Brazilian economy a good study for analyzing the behavior of companies when subject to a high volatility of macroeconomic fundamentals. The paper also mentions that the Brazilian derivative market was one of the most liquid in the world and after 1996 the Brazilian companies were required to report the use of financial instruments.
For companies where there is a high probability that they will incur costs related to financial distress there is also an increase in the use of currency derivatives to manage this risk.

One of the more interesting findings is the negative relationship between extension of hedging

and the ratio of foreign sales to total sales and companies' foreign operations suggesting that the use of currency derivatives was more related to country specific factors.

The sample included 212 Brazilian non-financial public traded companies and more than two thirds of all publicly traded companies and more than three quarters of market capitalization. The sample included both small and large companies with sizes varying between USD 50.3 million to USD 142, 000 million. Interest rate swaps are the most used currency derivative.

Summary of findings: the decision to use derivatives is directly related to the cost of hedging. Companies use currency derivatives in order reduce their foreign exchange exposure, companies that have significant foreign creditors are more likely to use currency derivatives.

A relationship exists between the use of derivatives and the macroeconomic environment, companies increased their hedging activities after the adoption of the floating exchange rate regime.

There is a direct correlation between the size of the company and their use of derivatives i.e. the large the company the more currency derivatives also firms with higher foreign currency debt versus total debt used currency derivatives more extensively.

Conclusion

Larger companies with higher foreign currency exposure and higher probability of incurring costs of financial distress are more likely to use foreign currency derivatives. Larger companies with higher growth opportunities and with higher levels of the ratio of foreign currency denominated debt to total debt, make more extensive use of currency derivatives. Unlike the results for developed countries those of exporters and companies with foreign subsidiaries reflect the use of less currency derivatives. It happens because companies see their revenue in foreign currency as a "natural" hedge to the exposure on the liability side of their balance sheets. Firms take decisions on hedging and indebtedness simultaneously. The use of currency derivatives increases debt capacity leading to higher levels of leverage and debt denominated in foreign currency.

Rafael F. Shiozer and Richard Saito published a paper in 2009 called "The Determinants of

Currency Risk Management in Latin American Non Financial Firms." The paper investigated currency risk management in non financial firms in Argentina, Brazil, Chile and Mexico (combined account for 90% of the market capitalization in Latin America) for the period 2001 to 2004. The sample included firms with American Depositary Receipts traded on the main U.S. exchanges – New York Stock Exchange, Nasdaq, and Amex as this ensured that the disclosures about the use of derivatives were made in accordance with Financial Accounting Standards Board (FASB). The sample accounted for three-quarters of market capitalization in Brazil and 50 percent in Mexico and Chile. More than 75 percent of these firms used derivatives to manage financial risk at the end of 2004. Fifty five firms were included in the sample and over the four years 183 firm observations were made. Only three firms (ten firm years) traded in derivatives.

The study examined not only the decision of whether or not to use derivatives but also the decision regarding the magnitude of risk to manage with derivatives and the finding was that the factors driving the decision were different. Larger firms were more likely to use derivatives however there was negative relation between size and the magnitude of risk management.

The finding was that the costs of financial distress were the main determinants of risk management for the firms in the sample. The second order finding was that firms engaged in derivatives programs to be able to assure funding for investment opportunities.

Foreign exchange derivatives were the most commonly used. Swaps were the most commonly used to manage interest rate and currency risk, for the firms where the maturity was disclosed these generally ranged from between three and six years, with cash exchange every six months. Futures and forwards were generally short-term contracts with maturities up to six months. Most of the contracts hedged against the US dollar and interest rates were mainly plain vanilla i.e. exchanging fixed for floating rates.

Brazilian and Chilean firms are more likely to use derivatives but also hedge more in terms of magnitude this is attributed to the greater development of the Brazilian and Chilean financial markets in relation to Argentina resulting in better access to hedging instruments, Argentina also had a pegged exchange rate regime until late 2001 which resulted in a scarcity of hedging instruments.

The reason for Mexico being lower than Brazil and Chile is attributed to the lower volatility of the Mexican Exchange rate or the low level of foreign ownership of Mexican firms.

Andreas Rivas, Felice Policastro and Teofilo Ozuna published a paper in the Global Journal of International Business Research in 2010 called "An Empirical Analysis of the use of derivatives by banks in Brazil, Chile and Mexico". The paper starts with some history and highlights the deregulation of the banking industry during the 1990's and the greater market volatility that came as a result thereof which resulted in an increased use of financial derivatives for risk management.

The sample included 133 Brazilian banks, 27 Chilean banks and 41 Mexican banks. The findings were that the difference between user and non user banks in Latin America related to the riskier capital structures and lower spread margin. On balance sheet activity such as liquidity was not a substitute for derivatives and derivatives were not being used to co-ordinate interest-rate risk and credit risk management strategies. Smaller banks benefited in the market for derivatives when they were foreign banks.

The paper made certain strong statements e.g. "*These results identifying a derivative user bank as a weak capitalized bank, which does not seek to hedge unwanted risk argue the need for any additional restrictions on derivative activities. Latin American policy makers need to address the possible speculative behavior of Latin American banks, otherwise they risk having an unstable and detrimental banking system*[1]*."*

Brazil, the paper refers to the changes the Central bank implemented i.e. granting domestic financial institutions the ability to compete internationally, implementing more accurate capital adequacy rules including country exposure and liquidity risk, and revising the accounting standards.

Chile, in 2000 there was a change to the Chilean's general banking laws which required the Superintendence of Bank and Financial Institutions (SBFI) to authorize all bank mergers and acquisitions as well as a change to the capital adequacy requirements both with regard to the

[1] Andreas Rivas, Felice Policastro and Teofilo Ozuna: An empirical analysis of the use of derivatives by banks in Brazil, Chile, and Mexico.

percentage from 8% to 14%, increasing technical reserves to 1.5 times capital reserves from 2.5 times, or reducing inter-bank loans to 20% from 30% of a bank's portfolio. The revised regulation also classified financial institutions into five categories by analyzing the standards and solvency of financial institutions and banks. There was also more transparency required with regard to the analysis of the risks related to incurring debt and the analysis of risk exposure.

Mexico, the National Commission of Banking and Security introduced relevant reforms for the Mexican banking system and Article 73 of the Law of Credit Institutions was modified to provide more controls around the granting of credit.

Findings, 85 of 133 Brazilian bank used derivatives, 28 out of 41 Mexican banks used derivatives and in Chile 23 out of 27 banks used derivatives.

The results support the view that the larger banks use more derivatives. What is interesting to note from this study is the finding that there is a negative relationship between interest rate risk exposure and the decision to use derivatives. Also Latin American banks are not using derivatives to manage interest rate risk and credit risk and lastly foreign banks use of derivatives is not significantly different to the local banks. This supports the strong conclusion referred to above and reiterated in the conclusion to the paper that consideration should be given to amending banking regulations to force the banks to use hedging to manage risks.

4. Sample and data

4.1 Overview

As similar published research is not currently available for Africa including South Africa and because of the JSE requirements mentioned above and the requirements of IFRS 7 which became effective for companies for year ends beginning on or after 1 January 2007 it was decided to review the African Countries as well as all listed South African Countries on the Johannesburg Stock Exchange (JSE) and the Alternative Exchange. It is worth noting that there were subsequent amendments to IFRS 7 after the original standard was issued however these did not detract from the original requirements but serve to increase the relevance of the disclosure by for example adding the requirement to include valuation levels for category of financial

instrument.

Due to the volume of companies the research was divided amongst nine students, with four of the nine students focusing on the JSE and the Alternative Exchange and the other five focusing on the African countries with stock exchanges. My portion and this paper specifically investigates the use of the second 100 largest listed companies on the JSE by market capitalization in 2010.

Note that the methods utilized in this study includes a comprehensive examination of Annual Reports published in 2010. This is in direct contrast to the methodology used in the above literature reviews as the literature reviews were for samples of firms that could include biases e.g. companies that did not use derivatives could potentially have ignored the survey as irrelevant and similarly companies using all four derivatives might have not wanted this information to be public knowledge so again could have ignored the survey and not responded. See appendix c) for the response rate for the surveys reviewed. Note, the following surveys were based on a specific sample for which all the information was available so were not included in the above appendix:

- Bartram, SM., Brown., G.W., and Fehle (2009) reviewed 7319 companies
- Jose Luiz and Rossi Junior (2007) reviewed 212 Brazilian non-financial public traded companies
- Rafael F. Shiozer and Richard Saito (2009) reviewed 212 Brazilian non public financial firms
- Andreas Rivas, Felice Policastro and Teofilo Ozuna (2010) 55 firms with American Depositary receipts traded on the main U.S. exchanges
- Grant, K. and Marshall, A.P., (1997) reviewed the largest 250 companies in the UK.

4.2 Details of appendices

The appendices included are as follows:

a) List of references for prior surveys
b) List of second 100 largest listed companies
c) Individual templates for the listed companies
d) Response rates for surveys reviewed as part of the literature review

5. Methodology

5.1. General Methodology

The annual report of the individual companies was sourced from the companies individual website's and reviewed for the use of derivatives which was then populated in a template to ascertain the use of the following derivatives, share based payments, swaps, options, forwards. The fair value of the derivatives on the balance sheet / statement of financial position was also reviewed and noted.

The market values were obtained from the JSE handbook for 2011 which listed the market values per sector and company as at 7 December 2010.

The different companies were then summarized per sector and use of derivatives to identify a trend both in sector and then also in size of company.

For further analysis the companies were divided into four groups by size using the market capitalization per company as at 7 December to identify trends based on the size of company.

6. Findings

Of the 100 companies sampled, 88 were reviewed, as the following companies were excluded because they were funds and Lereko Mobility was delisted during 2009. The financial statements for 2009 were reviewed and because this company was set up as a debenture structure to raise funds for the Imperial Group the exclusion does not affect any of the below statistics.

Funds

1. Satrix 40
2. CAP Property FD
3. Absa-Newf Sha 40
4. NewGold Iss L-GB
5. Satrix Indi
6. Premium Prop-UTS
7. Makalani Holdings
8. Fortress Inc-A
9. Satrix Fini
10. Trackhedge-NEWRD
11. Hospitality PR-A

Of the 88 companies reviewed, 49 reported using derivatives.
Of the 49 companies using derivatives, the type of derivative used was split as follows:

- Twenty four reported using interest rate swaps
- Thirty two used forward exchange contracts
- Twelve used options
- Two used futures

Only one company Afgri limited used all four derivatives.

Summary in table format (see detail in appendix A)

Company	Market cap at company 7 December 2010 R'm	Use derivatives Y/N	Swaps	Forward	Options	Futures	ESOPS	Forex Risk	Interest rate risk	Commodity price risk	Speculate (y/n)
Total number out of the 88		49	24	32	12	2	44	33	23	13	0
Percentage out of 88		56%	27%	36%	14%	2%	50%	38%	26%	15%	0%

The sector split was as follows:

- Basic materials – twelve
- Consumer Services – eight
- Financial Services – nine
- Industrial Goods and Services – thirteen
- Information Technology – four
- Mining – one

The above is more an indication of the sectors that are represented in the 2nd 100 listed companies than a trend in the use of derivatives per sector given that the numbers of companies that use derivatives in the different sectors are almost mirrored in terms of the sectors for the companies that do not use derivatives see below.

No derivatives

- Basic materials – seven
- Consumer services – eight
- Financial Services – ten
- Industrial Goods and Services – ten
- Information Technology – three
- One company that was moved to the Alternative Exchange

The market capitalization of the companies that use derivatives for the 2nd 100 largest JSE listed companies ranges from R18, 135 million to R619 million (refer to below table and summaries of large, medium and small companies therefore size does appear to play a role although not as significant as expected. Refer to appendix b.

Note that none of the companies that were reviewed used derivatives for speculative purposes.

Population analysis based on size

Although the population has been carved out of a bigger population being all the companies listed on the JSE, I believe that it is worthwhile further stratifying the population as follows:

Large companies (market capitalization greater than R5 billion)

Companies with a market capitalization greater than R5 billion, of which at the 7 December 2010 there were 13 in my population out of the 88 companies analysed.

As can be seen from the below these consist of companies across the various sectors which is consistent with the second 100 companies as listed in the complete 88 companies in appendix a. Only two of companies (15%) did not use derivatives and only one did not have some form of share based payment arrangement in place for employees.

Large companies

Company	Market cap at company 7 December 2010 R'm	Sector	Use derivatives Y/N	Swaps	Forward	Options	Futures	ESOPS	Dilution impact (%)	Forex Risk	Interest rate risk
AQUARIUS PLATINU	18,134	Basic Materials	1	0	1	0	0	1	0.00	0	0
PICK'N PAY HLDGS	11,035	Consumer Services	1	0	1	0	0	1	2.18	1	0
MONDI LTD	7,931	Basic Materials	1	1	1	1	0	1	0.32	1	1
OPTIMUM COAL HOL	6,924	Basic Materials	1	0	0	1	0	1	0.00	0	0
JSE LTD	6,779	Financial Services	1	0	0	1	0	1	1.84	0	0
TRENCOR LTD	6,760	Industrial goods and services	1	1	1	0	0	1	0.11	0	1
PSG GROUP LTD	6,678	Financial Services	1	1	0	0	0	1	1.00	0	1
ACUCAP PROPERTIE	5,793	Financial Services	1	1	0	0	0	0	0.00	0	1
CORONAT	5,336	Financial Services	0	0	0	0	0	1	0.03	0	0
ASTRAL FOODS LTD	5,312	Consumer Services	1	0	0	1	0	1	0.02	1	0
BLUE LABEL TELEC	5,288	Information Technology	0	0	0	0	0	1	0.68	0	0
VUKILE PROPERTY	5,160	Financial Services	1	1	0	0	0	1	0.00	0	1
PALABORA MINING	5,148	Mining	1	1	0	0	0	1	0.00	0	0

Some might argue that this population is skewed in that we have two companies i.e. Mondi and Pick 'n Pay that have market capitalizations of greater than R11 billion with the next company only having a market capitalization of R7.9 billion however this does not appear to impact on the results as can be seen above.

Medium Companies (R2 billion to R5 billion)

There are 32 companies with a market capitalization above R1 billion and below R5 billion. Eighteen of the 32 companies do not use derivatives at all (56.25%) and 27 of the 35 (77%) have some form of share based payment arrangement in place. The share based payment percentage is consistent with the rest of the surveys and the overall

population but the drop in use of derivatives is perhaps not as in line as expected.

Small companies (less than R2 billion)

The balance of the population includes companies with a market capitalization less than R2 billion (smaller companies) here we expect very few of the companies to be using derivatives due to the size but also due to the perceived expense associated with the use of derivatives. However surprisingly enough the number of companies that use derivatives are 20 out of the 43 companies left in the sample (47%). So what type of derivatives are these "smaller companies" using? The largest portion are using forward agreements 17 out of 48 (35%), with the next highest being swaps at 7 out of 48 (15%) which is consistent with the types of risk that are faced by most companies being foreign exchange and interest rate risk. As a side issue 71% of the companies have some form of equity compensation scheme in place which is consistent with expectations.

Equity Share Option Schemes

Of the 88 companies reviewed an overwhelming 73 out of the 88 (83%) companies had share based payment compensation as part of their remuneration. For the rest of the companies the reasons for not having equity related compensation or for the share options not resulted in a diluted earnings per share base is as a result of the company's being in a net loss position, the share options being anti-dilutive (out of the money) or in the one case the company issuing linked units in property investments. The company's that did not have share based payments or share appreciation rights in issue for the period under review are as follows:

No share based payments

Company	Use derivatives Y/N	Swaps	Forward	Options	Futures	ESOPS	Dilution impact (%)	Forex Risk	Interest rate risk	Commodity price risk	Speculate (y/n)
ACUCAP PROPERTIES	1	1	0	0	0	0	0.00	0	1	0	0
ADVTECH LTD	0	0	0	0	0	0	0.00	0	0	0	0
CLIENTELE LTD	0	0	0	0	0	0	0.00	0	0	0	0
GRAND PARADE INV	0	0	0	0	0	0	0.00	0	0	0	0
HOWDEN AFRICA	0	0	0	0	0	0	0.00	0	0	0	0
ILIAD AFRICA LTD	0	0	0	0	0	0	0.00	0	0	0	0
METMAR LTD	1	0	1	0	0	0	0.00	1	0	0	0
MOBILE INDS LTD	0	0	0	0	0	0	0.00	0	0	0	0
OCTODEC INVESTME	0	0	0	0	0	0	0.00	0	0	0	0
PALADIN CAPITAL	0	0	0	0	0	0	0.00	0	0	0	0
PINNACLE TECHNOL	1	0	1	0	0	0	0.00	1	0	0	0
REAL AFRICA HLDG	0	0	0	0	0	0	0.00	0	0	0	0
SYCOM PROPERTY	0	0	0	0	0	0	0.00	0	0	0	0
WESIZWE PLATINUM	0	0	0	0	0	0	0.00	0	0	0	0
ZEDER INVESTMENT	0	0	0	0	0	0	0.00	0	0	0	0

Interesting to note from the above analysis that only three of the fifteen companies used derivatives which could be an indication of the conservative nature of the board of directors and / or the lack of risk related to financial instruments.

Earnings per share

The knock on effect of issuing share based payments is that although you have a more motivated work force because of their vested interest financially in the share price there is also an impact of the share options on diluted earnings per share ratio due to the impact of the potentially exercisable share options into either shares or cash compensation based on the value of the shares with the resultant impact on earnings i.e. share appreciation rights.

Due to the number of companies that use this type of compensation both because of the motivational factor and then also the potential for increasing the points in terms of the black economic empowerment requirements the expectation is that this does not have a

significant impact on the diluted earnings per share ratio.

An investigation revealed the following:
Nine companies (10%) had a greater than 5% impact in diluted earnings per share with the highest being for Hudaco holdings at 18.42%. Twenty companies had a greater than 1% and less than 5% impact and the rest all had a less than 1% impact with 33 companies (37.5%) having a zero impact on diluted earnings per share either because of having no share based payment schemes (13 companies) or the shares being anti dilutive or the impact being negligible. The average dilution on the companies that issued share options was 1.76%.

Comparison to other country surveys by market capitalization

The majority of surveys followed the Bodnar methodology when it came to definitions and samples i.e. the findings were split into small (market value below USD 50 million), medium (market value between USD 50 million and USD 250 million) and large companies (market value greater than USD 50 million). See below table where the market capitalization was converted from ZAR to USD using the rate quoted on www.exchangerates.org.uk a rate of 1 USD = 6.8935 ZAR (appendix b), the companies are split into the large, medium and small categories as per above.

The findings are consistent with the findings in the above surveys:
There are a total of 52 companies (59%) that qualify for the large category of which 65% use derivatives. In the medium category we have 35 (40%) of which 43% use derivatives and in the small category there is only one company (1%) and this company does not use derivatives.

It will be interesting to see in the combined paper if any of the smaller companies in the rest of population of the JSE listed companies and Alternative Exchange use derivatives as in the most recent paper published by Bodnar (2006) there was an increase in the use of derivatives by the small and medium companies.

7. Conclusion

So can we draw comparisons with the International Studies and the conclusion would have to be if any it would be a limited conclusion as although IFRS is a requirement in South Africa so the information is readily available and audited the rest cannot be said for countries like the United States where United States Generally Accepted Accounting Practice is still used and the debate is still raging on as to whether IFRS will be adopted.

The surveys reviewed were also based on very limited populations and as with all surveys are reliant on amongst other things the response rates from those being surveyed. With all surveys there will always be biases in that it would be the more "balanced firms" that would respond e.g. companies that use all four derivatives might not want this to be public knowledge and neither the companies that have not used derivatives may not have responded to the survey. See appendix c) for detailed response rates where less than 100% response rate was received also refer to paragraph 4.1.

So if one compares the methodology for this study where the entire universe of companies was reviewed versus the International survey it would be naïve to draw any lasting conclusions but more this would hope to give the reader a feel for what the companies in South Africa and for this study specifically the middle tier companies use of derivatives is and the resultant impact of share based payment arrangements is on diluted earnings per share.

Based on the research performed and the findings above it can be concluded that an overwhelming majority of the companies in the 2nd 100 listed companies use share based payments as a form of incentive / remuneration which illustrates a trend in company's behavior to link staff incentives with company performance to align the shareholders and staff interest as well as comply with government requirements for black economic empowerment However it was noted that in certain cases the options were out of the money which is again as a result of the state of the economy and the impact of the global economic crisis on share prices. The resultant impact of the share based payment arrangements on diluted earnings per share except for nine of the

companies (10%) can be considered almost negligible when compared to the perceived benefits. However one can argue that at least for the empowerment transactions the impact on the economy and on the individuals meant to be "empowered" will only be proven once the vesting conditions are met which for most of the schemes will still take a while.

With regard to the usage of the big four derivates the findings are in line with the surveys published and referred to above in that the most significant risk that is hedged using derivatives is interest rate risk and foreign exchange risk and even for the companies that are not using these derivatives currently most of the company's indicate that should the need arise they would utilise the above two derivatives to hedge significant exposure.

In terms of the rest of the big four derivatives, the twelve companies that use options are mainly hedging commodity price risk and six of the twelve companies are in the basic materials and resources sectors which are heavily dependent on commodities.

All three companies that use futures are in the basic materials sector and again use futures to hedge commodity price risk.

Based on the findings above South Africa and specifically the companies listed in the 2nd top 100 are fairly risk aware and hedge risks as appropriate using mainly interest rate swaps and forward exchange contracts which are consistent with the rest of the world where similar surveys have been performed.

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Appendices

a) List of second 100 largest listed companies

Company	Market cap at company 7 December 2010 R'm	Sector	Use derivatives Y/N	Swaps	Forward	Options	Futures	ESOPS	Dilution impact (%)	Forex Risk	Interest rate risk	Commodity price risk	Speculate (y/n)
AQUARIUS PLATINU	18,134	Basic Materials	1	0	1	0	0	1	0.00	0	0	1	0
PICK'N PAY HLDGS	11,035	Consumer Services	1	0	1	0	0	1	2.18	1	0	0	0
MONDI LTD	7,931	Basic Materials	1	1	1	1	0	1	0.32	1	1	1	0
OPTIMUM COAL HOL	6,924	Basic Materials	1	0	0	1	0	1	0.00	0	0	1	0
JSE LTD	6,779	Financial Services	1	0	0	1	0	1	1.84	0	0	1	0
TRENCOR LTD	6,760	Industrial goods and services	1	1	1	0	0	1	0.11	0	1	0	0
PSG GROUP LTD	6,678	Financial Services	1	1	0	0	0	1	1.00	0	1	0	0
ACUCAP PROPERTIE	5,793	Financial Services	1	1	0	0	0	0	0.00	0	1	0	0
CORONAT	5,336	Financial Services	0	0	0	0	0	1	0.03	0	0	0	0
ASTRAL FOODS LTD	5,312	Consumer Services	1	0	0	1	0	1	0.02	1	0	1	0
BLUE LABEL TELEC	5,288	Information Technology	0	0	0	0	0	1	0.68	0	0	0	0
VUKILE PROPERTY	5,160	Financial Services	1	1	0	0	0	1	0.00	0	1	0	0
PALABORA MINING	5,148	Mining	1	1	0	0	0	1	0.00	0	0	1	0
NET 1 UEPS TECH	4,970	Industrial goods and services	1	0	1	0	0	1	0.33	1	0	0	0
METOREX LTD	4,911	Basic Materials	1	0	1	0	0	1	0.44	1	0	0	0
OMNIA HOLDINGS	4,524	Basic Materials	1	1	1	1	0	1	0.58	1	1	1	0
GROUP FIVE LTD	4,451	Industrial goods and services	1	1	1	0	0	1	3.48	1	1	0	0
OCEANA GROUP LTD	4,405	Consumer Services	1	0	1	0	0	1	2.94	1	0	0	0
SYCOM PROPERTY	4,350	Financial Services	0	0	0	0	0	0	0.00	0	0	0	0
RAUBEX GROUP LTD	4,244	Industrial goods and services	1	0	1	0	0	1	1.21	1	0	0	0
FAMOUS BRANDS LT	4,242	Consumer Services	1	1	0	0	0	1	3.25	0	1	0	0
PLATMIN LTD	4,133	Basic Materials	0	0	0	0	0	1	0.00	0	0	0	0
ITALTILE LTD	3,947	Consumer Services	0	0	0	0	0	1	0.11	0	0	0	0

Company	Market cap at company 7 December 2010 R'm	Sector	Use derivatives Y/N	Swaps	Forward	Options	Futures	ESOPS	Dilution impact (%)	Forex Risk	Interest rate risk	Commodity price risk	Speculate (y/n)
MERAFE RESOURCES	3,788	Basic Materials	1	1	0	0	0	1	2.93	0	1	0	0
CAPEVIN INVESTME	3,633	Consumer Services	0	0	0	0	0	1	0.00	0	0	0	0
CITY LODGE HOTEL	3,621	Consumer Services	1	1	0	0	0	1	0.92	0	1	0	0
INVICTA HLDGS	3,178	Industrial goods and services	1	1	0	0	0	1	2.70	0	1	1	0
CIPLA MEDPRO SOU	3,178	Health and Pharmaceutical	1	1	1	0	0	1	0.69	1	1	0	0
MOBILE INDS LTD	3,097	Industrial goods and services	0		0	0	0	0	0.00	0	0	0	0
AVUSA LTD	2,862	Consumer Services	1	0	1	0	0	1	0.02	1	0	0	0
CLIENTELE LTD	2,850	Financial Services	0	0	0	0	0	0	0.00	0	0	0	0
BRAIT SA	2,802	Financial Services	1	0	0	1	0	1	0.99	1	0	0	0
HULAMIN LTD	2,797	Basic Materials	1	1	1	0	1	1	1.34	1	1	1	0
AFGRI LTD	2,790	Basic Materials	1	1	1	1	1	1	9.09	1	1	1	0
HUDACO INDS LTD	2,782	Industrial goods and services	1	0	1	0	0	1	18.42	1	0	0	0
CERAMIC INDUSTR	2,739	Industrial goods and services	0	0	0	0	0	1	2.01	1	0	0	0
PEREGRINE HOLD	2,646	Financial Services	1	1	1	0	0	1	0.00	1	0	1	0
EQSTRA HOLDINGS	2,609	Industrial goods and services	1	1	0	1	0	1	10.52	0	1	1	0
CASHBUILD LTD	2,516	Consumer Services	0	0	0	0	0	1	2.03	0	0	0	0
ZEDER INVESTMENT	2,484	Financial Services	0	0	0	0	0	0	0.00	0	0	0	0
ADVTECH LTD	2,365	Consumer Services	0	0	0	0	0	0	0.00	0	0	0	0
ZURICH INSURANCE	2,253	Financial Services	0	0	0	0	0	1	0.07	0	0	0	0
KAGISO MEDIA LTD	2,210	Consumer Services	0	0	0	0	0	1	0.11	0	0	0	0
STEFANUTTI STOCK	2,155	Industrial goods and services	0	0	0	0	0	1	7.61	0	0	0	0
BUSINESS CONNEX	2,041	Information Technology	0	0	0	0	0	1	0.90	0	0	0	0
ADCORP HOLDINGS	1,936	Industrial goods and services	1	1	0	0	0	1	2.54	0	1	0	0
FREEWORLD COATI	1,910	Basic Materials	1	1	1	0	0	1	0.00	1	1	0	0
WITSGOLD	1,897	Basic Materials	0	0	0	0	0	1	0.45	0	0	0	0
METAIR INVTS LTD	1,870	Consumer Services	1	0	1	0	0	1	0.00	1	0	0	0

Company	Market cap at company 7 December 2010 R'm	Sector	Use derivatives Y/N	Swaps	Forward	Options	Futures	ESOPS	Dilution impact (%)	Forex Risk	Interest rate risk	Commodity price risk	Speculate (y/n)
PALADIN CAPITAL	1,846	Altx	0	0	0	0	0	0	0.00	0	0	0	0
DISTRIBUTION & W	1,838	Industrial goods and services	1	1	1	0	0	1	6.86	1	1	0	0
PETMIN LTD	1,788	Basic Materials	1	0	1	1	0	1	5.73	1	1	0	0
WESIZWE PLATINUM	1,676	Basic Materials	0	0	0	0	0	0	0.00	0	0	0	0
OCTODEC INVESTME	1,598	Financial Services	0	0	0	0	0	0	0.00	0	0	0	0
MVELAPHANDA GROU	1,566	Financial Services	1	1	0	0	0	1	0.00	0	1	0	0
COMBINED MOTOR	1,475	Consumer Services	0	0	0	0	0	1	1.63	0	0	0	0
SENTULA MINING L	1,466	Basic Materials	0	0	0	0	1	1	0.02	0	0	0	0
BASIL READ HLDGS	1,461	Industrial goods and services	1	0	1	0	0	1	0.21	1	0	0	0
SPUR CORP LTD	1,368	Consumer Services	0	0	0	0	0	1	9.99	0	0	0	0
DRDGOLD LTD	1,363	Basic Materials	0	0	0	0	0	1	4.60	0	0	0	0
GRAND PARADE INV	1,318	Financial Services	0	0	0	0	0	0	0.00	0	0	0	0
EOH HOLDINGS LTD	1,318	Information Technology	1	0	1	0	0	1	15.11	1	0	0	0
SASFIN HOLDINGS	1,259	Financial Services	1	0	1	1	0	1	0.17	1	0	0	0
SIMMER & JACK	1,254	Basic Materials	1	0	0	1	0	1	2.22	1	0	0	0
ASTRAPAK LTD-UTS	1,251	Industrial goods and services	1	0	1	0	0	1	2.98	1	0	0	0
REAL AFRICA HLDG	1,245	Financial Services	0	0	0	0	0	0	0.00	0	0	0	0
PINNACLE TECHNOL	1,142	Information Technology	1	0	1	0	0	0	0.00	1	0	0	0
COMAIR LTD	1,125	Consumer Services	1	0	1	0	0	1	3.87	1	0	0	0
ILIAD AFRICA LTD	1,109	Industrial goods and services	0	0	0	0	0	0	0.00	0	0	0	0
KAP INTERNATIONA	1,104	Industrial goods and services	0	0	1	0	0	1	0.00	1	0	0	0
DATACENTRIX HOLD	1,067	Information Technology	0	0	0	0	0	1	0.77	0	0	0	0
DATATEC LTD	1,067	Information Technology	1	1	1	1	0	1	0.26	1	1	1	0
METMAR LTD	1,007	Basic Materials	1	0	1	0	0	0	0.00	1	0	0	0

Company	Market cap at company 7 December 2010 R'm	Sector	Use derivatives Y/N	Swaps	Forward	Options	Futures	ESOPS	Dilution impact (%)	Forex Risk	Interest rate risk	Commodity price risk	Speculate (y/n)
BELL EQUIPMENT	918	Industrial goods and services	1	0	1	0	0	1	0.00	1	0	0	0
ARGENT INDUS LTD	895	Basic Materials	1	0	1	0	0	1	0.00	1	0	0	0
PHUMELELA GAMING	887	Consumer Services	0	0	0	0	0	1	0.00	0	0	0	0
BUILDWORKS GROUP	830	Industrial goods and services	0	0	0	0	0	1	12.78	0	0	0	0
MERCANTILE BANK	827	Financial Services	1	1	1	0	0	1	0.46	1	1	0	0
MIX TELEMATICS	821	Industrial goods and services	0	0	0	0	0	1	0.00	0	0	0	0
CADIZ HOLDINGS	821	Financial Services	0	0	0	0	0	1	0.60	0	0	0	0
VALUE GROUP LTD	735	Industrial goods and services	0	0	0	0	0	1	1.8	0	0	0	0
GIJIMA AST GROUP	697	Information Technology	1	0	1	0	0	1	0.00	1	0	0	0
HOWDEN AFRICA	661	Industrial goods and services	0	0	0	0	0	0	0.00	0	0	0	0
DIGICORE HOLDING	653	Industrial goods and services	0	0	0	0	0	1	0.00	0	0	0	0
KEATON	652	Basic Materials	0	0	0	0	0	1	0.00	0	0	0	0
ESORFRANKI LTD	619	Industrial goods and services	1	1	0	0	0	1	1.16	0	1	0	0
DELTA EMD LTD	516	Basic Materials	0	0	0	0	0	1	0.44	0	0	0	0
BRIMSTONE INVEST	337	Financial Services	0	0	0	0	0	1	1.47	0	0	0	0

b) List of second 100 largest listed companies as at 7 December where market capitalization is quoted in USD.

Company	Sector	Use derivatives Y/N	Market cap at 7 Dec in USD	Small, medium or large
AQUARIUS PLATINU	Basic Materials	1	2,630,579,531.44	large
PICK'N PAY HLDGS	Consumer Services	1	1,600,826,865.89	large
MONDI LTD	Basic Materials	1	1,150,504,098.06	large
OPTIMUM COAL HOL	Basic Materials	1	1,004,438,964.24	large
JSE LTD	Financial Services	1	983,375,643.72	large
TRENCOR LTD	Industrial goods and services	1	980,648,436.93	large
PSG GROUP LTD	Financial Services	1	968,767,679.70	large
ACUCAP PROPERTIE	Financial Services	1	840,327,845.07	large
CORONAT	Financial Services	0	774,091,535.50	large
ASTRAL FOODS LTD	Consumer Services	1	770,537,462.83	large
BLUE LABEL TELEC	Information Technology	0	767,084,935.08	large
VUKILE PROPERTY	Financial Services	1	748,516,718.65	large
PALABORA MINING	Mining	1	746,775,948.36	large
NET 1 UEPS TECH	Industrial goods and services	1	720,940,015.96	large
METOREX LTD	Basic Materials	1	712,424,747.95	large
OMNIA HOLDINGS	Basic Materials	1	656,255,893.23	large
GROUP FIVE LTD	Industrial goods and services	1	645,651,700.88	large
OCEANA GROUP LTD	Consumer Services	1	639,065,786.61	large
SYCOM PROPERTY	Financial Services	0	630,971,204.76	large
RAUBEX GROUP LTD	Industrial goods and services	1	615,695,945.46	large

Company	Sector	Use derivatives Y/N	Market cap at 7 Dec in USD	Small, medium or large
FAMOUS BRANDS LT	Consumer Services	1	615,333,284.98	large
PLATMIN LTD	Basic Materials	0	599,477,768.91	large
ITALTILE LTD	Consumer Services	0	572,611,880.76	large
MERAFE RESOURCES	Basic Materials	1	549,459,635.89	large
CAPEVIN INVESTME	Consumer Services	0	527,018,205.56	large
CITY LODGE HOTEL	Consumer Services	1	525,248,422.43	large
INVICTA HLDGS	Industrial goods and services	1	461,072,024.37	large
CIPLA MEDPRO SOU	Health and Pharmaceutical	1	461,043,011.53	large
MOBILE INDS LTD	Industrial goods and services	0	449,307,318.49	large
AVUSA LTD	Consumer Services	1	415,159,207.95	large
CLIENTELE LTD	Financial Services	0	413,476,463.34	large
BRAIT SA	Financial Services	1	406,498,875.75	large
HULAMIN LTD	Basic Materials	1	405,715,529.12	large
AFGRI LTD	Basic Materials	1	404,729,092.62	large
HUDACO INDS LTD	Industrial goods and services	1	403,525,059.84	large
CERAMIC INDUSTR	Industrial goods and services	0	397,258,286.79	large
PEREGRINE HOLD	Financial Services	1	383,883,368.39	large
EQSTRA HOLDINGS	Industrial goods and services	1	378,443,461.23	large
CASHBUILD LTD	Consumer Services	0	364,981,504.32	large
ZEDER INVESTMENT	Financial Services	0	360,382,969.46	large
ADVTECH LTD	Consumer Services	0	343,062,305.07	large
ZURICH INSURANCE	Financial Services	0	326,858,634.95	large

Company	Sector	Use derivatives Y/N	Market cap at 7 Dec in USD	Small, medium or large
KAGISO MEDIA LTD	Consumer Services	0	320,620,874.74	large
STEFANUTTI STOCK	Industrial goods and services	0	312,671,357.08	large
BUSINESS CONNEX	Information Technology	0	296,090,520.06	large
ADCORP HOLDINGS	Industrial goods and services	1	280,829,767.17	large
FREEWORLD COATI	Basic Materials	1	277,116,123.88	large
WITSGOLD	Basic Materials	0	275,186,770.15	large
METAIR INVTS LTD	Consumer Services	1	271,270,036.99	large
PALADIN CAPITAL	Altx	0	267,832,015.67	large
DISTRIBUTION & W	Industrial goods and services	1	266,613,476.46	large
PETMIN LTD	Basic Materials	1	259,432,799.01	large
Total number of large companies		**34**		**52**
Total percentage of large companies using derivatives		**65%**		

Total number of medium companies using derivatives

Company	Sector	Use derivatives Y/N	Market cap at 7 Dec in USD	Small, medium or large
WESIZWE PLATINUM	Basic Materials	0	243,084,064.70	medium
OCTODEC INVESTME	Financial Services	0	231,870,602.74	medium
MVELAPHANDA GROU	Financial Services	1	227,228,548.63	medium
COMBINED MOTOR	Consumer Services	0	213,969,681.58	medium

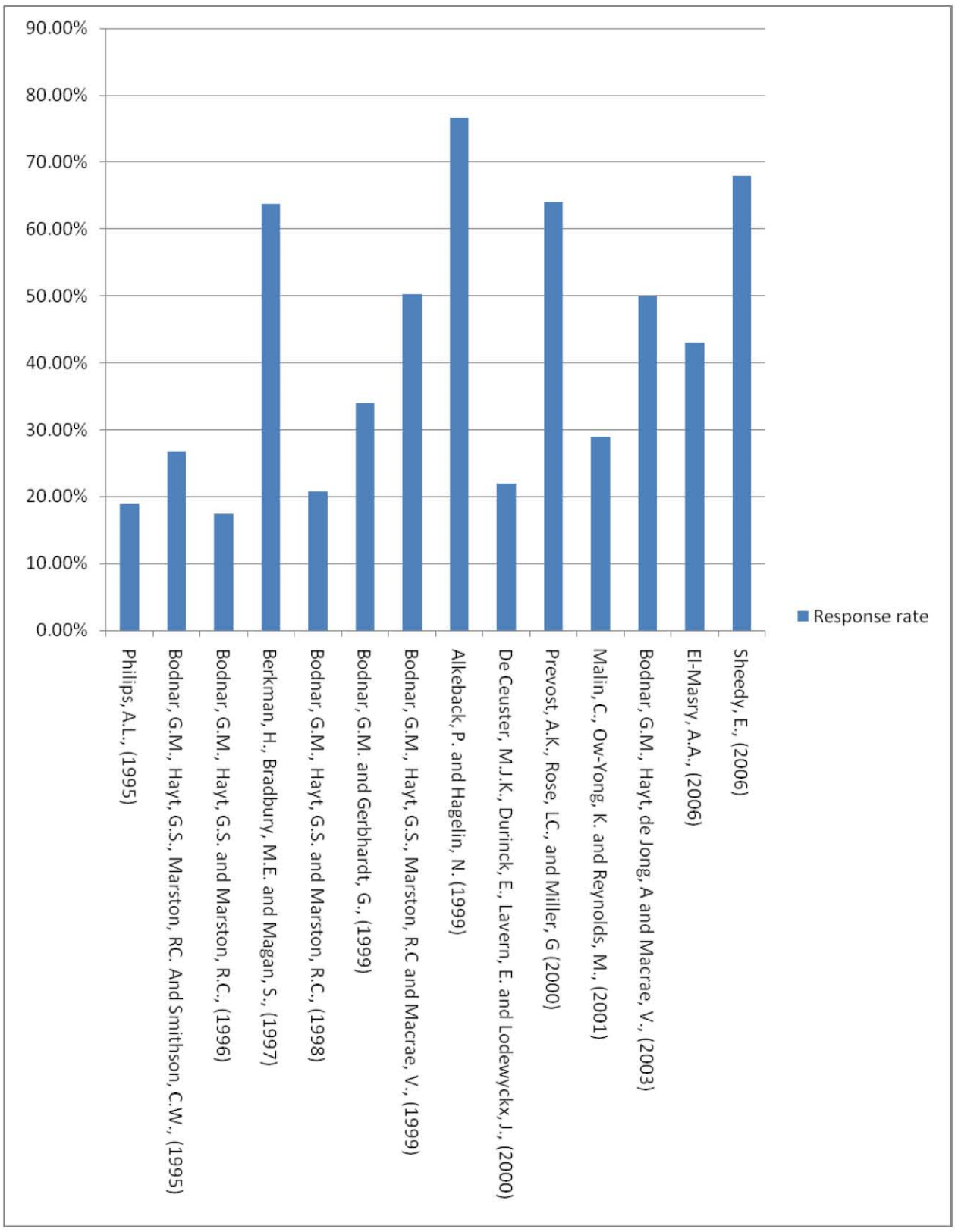
Company	Sector	Use derivatives Y/N	Market cap at 7 Dec in USD	Small, medium or large
SENTULA MINING L	Basic Materials	0	212,722,129.54	medium
BASIL READ HLDGS	Industrial goods and services	1	211,938,782.91	medium
SPUR CORP LTD	Consumer Services	0	198,418,800.32	medium
DRDGOLD LTD	Basic Materials	0	197,649,960.11	medium
GRAND PARADE INV	Financial Services	0	191,136,577.94	medium
EOH HOLDINGS LTD	Information Technology	1	191,122,071.52	medium
SASFIN HOLDINGS	Financial Services	1	182,650,322.77	medium
SIMMER & JACK	Basic Materials	1	181,881,482.56	medium
ASTRAPAK LTD-UTS	Industrial goods and services	1	181,518,822.08	medium
REAL AFRICA HLDG	Financial Services	0	180,662,943.35	medium
PINNACLE TECHNOL	Information Technology	1	165,590,773.92	medium
COMAIR LTD	Consumer Services	1	163,211,721.19	medium
ILIAD AFRICA LTD	Industrial goods and services	0	160,803,655.62	medium
KAP INTERNATIONA	Industrial goods and services	0	160,092,841.08	medium
DATACENTRIX HOLD	Information Technology	0	154,841,517.37	medium
DATATEC LTD	Information Technology	1	154,841,517.37	medium
METMAR LTD	Basic Materials	1	146,007,108.15	medium
BELL EQUIPMENT	Industrial goods and services	1	133,197,940.09	medium
ARGENT INDUS LTD	Basic Materials	1	129,759,918.76	medium
PHUMELELA GAMING	Consumer Services	0	128,628,418.07	medium
BUILDWORKS GROUP	Industrial goods and services	0	120,374,265.61	medium
MERCANTILE BANK	Financial Services	1	119,997,098.72	medium

Company	Sector	Use derivatives Y/N	Market cap at 7 Dec in USD	Small, medium or large
MIX TELEMATICS	Industrial goods and services	0	119,141,219.99	medium
CADIZ HOLDINGS	Financial Services	0	119,126,713.57	medium
VALUE GROUP LTD	Industrial goods and services	0	106,607,673.90	medium
GIJIMA AST GROUP	Information Technology	1	101,138,753.90	medium
HOWDEN AFRICA	Industrial goods and services	0	95,829,404.51	medium
DIGICORE HOLDING	Industrial goods and services	0	94,726,916.66	medium
KEATON	Basic Materials	0	94,552,839.63	medium
ESORFRANKI LTD	Industrial goods and services	1	89,852,759.85	medium
DELTA EMD LTD	Basic Materials	0	74,882,135.34	medium
Total number of medium companies		15		35
Total number of medium companies using derivatives		43%		

Small company, note this company does not use derivatives

Company	Sector	Use derivatives Y/N	Market cap at 7 Dec in USD	Small, medium or large
BRIMSTONE INVEST	Financial Services	0	48,857,619.50	small

Appendix c)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Philips, A.L., (1995)
Bodnar, G.M., Hayt, G.S., Marston, RC. And Smithson, C.W., (1995)
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Berkman, H., Bradbury, M.E. and Magan, S., (1997)
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Alkeback, P. and Hagelin, N. (1999)
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El-Masry, A.A., (2006)
Sheedy, E., (2006)