

Can listed property shares be a surrogate for direct property investment behavior?

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ABSTRACT

The listed property sector in South Africa has grown to a size which could be considered to be a good representation of the income producing property market in general. The study investigates the share prices of listed property funds in South Africa in order to investigate the relationship between listed property share prices and the property values in such listed funds. The share prices are correlated with various factors, such as the accounting ratio's of the companies, the financial statements of the companies and general economic variables.

Stock market listed property investment funds offer the opportunity to compare indirect property investment to direct property investment, which could bridge the gap between irrational investment behaviour and intrinsic asset values. The seven largest property loan stock companies in South Africa, which represents 90% of the PLS sector, were selected for the study. The daily share price movement is correlated with the value of the shares as per accounting methods of valuation and compared to the actual property values as appeared in the financial statements of these companies.

The outcome of the study is an explanation of the behaviour of listed property shares, and its relationship to the direct property market and the general economy. This would assist in the explanation of market behaviour and provides the opportunity to more accurately predict return requirements of investors, which might be used in the valuation of individual assets.

Key words: Property demand, property values, macro-economic property variables, construction demand.

INTRODUCTION

Behavioral finance theory has shown that share price movement follows the irrational behavior of the market and that the market is not as efficient as traditional economic theory would want to believe. According to Shiller (2003, p 102), *"The fundamental value of stocks is hard to measure, and moreover, if speculative bubbles last a long time, then even this fundamental relation may not be observed except in very long sample periods."*

The above is understandable for the different listed companies that are providing different services, manufacturing, mining, etc. Such a company should use its assets to derive an income, and the effectiveness of the management of such a company will determine the amounts of profits that could be delivered. This means the more effective the assets could be utilized in mining or manufacturing processes, the more profitable the company, and theoretically the more popular its shares would be. But investors do not have the inside details of these companies and are therefore reacting differently on different events that could cause the company's share price to change. This ultimately causes the share prices to be very volatile, with movements that could not always be directly correlated to specific events.

But what about listed property stocks? A listed property company is not much different from a portfolio of properties that is owned by a number of shareholders, apart from the fact that there is a number of people that are operating these properties on behalf of the shareholders, and the shareholders could exchange their shares on the stock exchange. Ultimately it is still just a number of investors that together own a portfolio of properties. This means that the share price of a listed property fund should be stable, and theoretically mimic property values.

The outcome explains the share price of the listed property company in relation to the different variables, from where it is possible to make predictions in the direct property investment market, by considering activities in the indirect investment market.

BACKGROUND TO THE STUDY

Giliberto (1989) stated that EREIT's correlation with the stock market has declined over time, while the correlation with bond returns has increased.

Institutional as well as individual investors often perceive investment in listed property vehicles or Real Estate Funds such as Property Loan Stock (PLS) or Property Unit Trusts (PUT), to be equivalent to investment in direct real estate, while retaining a degree of liquidity that is unavailable from other forms of real estate investment. The presumption is that Listed Real Estate Funds are influenced by factors similar to that influencing direct real estate. Yet the correlation between indices of listed funds and direct property investment is questionable. Hartzell and Mengden (1986) found that American Equity Real Estate Investment Trusts (EREIT's) prices track the stock market, with its attendant volatility, but have income characteristics of direct real estate investment. (Giliberto, 1990).

Giliberto (1990) showed that stock and bond market movements heavily influence EREIT's performance, but have a relative minor effect on direct real estate investment. However, if financial market effects are removed, a strong positive correlation is evident. This suggests the presence of a common factor, or factors in both sets of returns.

Fisher, Geltner & Webb (1994), considered the history of commercial property values by comparing different methods of constructing commercial property value indices and return series. Three types of indices were examined:

- (i) Indices that attempt to reconstruct property market values by "unsmoothing" appraisal-based indices;
- (ii) Indices that trace average ex post transaction prices of commercial properties over time; and
- (iii) an index based on unlevering REIT share prices.

Under the three types, five indices of the historical value of commercial property have been quantified. Some common messages emerged from the different indices, and as the indices have been developed using different methodologies and assumptions, and to some extent different data, the conclusion is considered fairly robust.

The different indices showed a fair pattern in terms of property values over time, therefore confirming each other's findings. Some other interesting differences also emerge across the different indices, which reveal and illustrate aspects of the index construction methodology as well as the nature of commercial property markets.

All the indices show greater volatility than the appraisal-based index, with the transaction price index and REIT share price index showing visibly greater volatility than the other indices. This shows the influence of the transactions on volatility, but also contains more "noise" than the other indices. Another interesting phenomenon is that the appraisal-based index lagged behind the REIT share price index by approximately two years, indicating that the REIT share price index registers value changes much quicker, which might also explain the higher volatility.

Geltner (1996) introduced a Repeated-Measures-Regression-Based Index (RMR) which allows the construction of indices of capital value at a greater frequency than the interval time between the reappraisals of the properties within the index. The RMR has been widely used in the construction of transaction price-based housing indexes in the United States, but was not used for appraisal based indexes of commercial property. Geltner investigated the application of the method for use in appraisal based indices of commercial property.

Booth and Marcato (2004) noted that performance information on direct real estate investment is suffering from a lack of timeliness and reliability. They mentioned that direct real estate indices do not measure the performance of underlying transaction prices properly because they are based on valuations, and therefore maybe subject to valuation smoothing. Indirect real estate indices do not properly measure the value investors put on the underlying assets of real estate companies, because real estate companies are geared.

Booth and Marcato suggests that the analysis of the relationship between annual returns from direct

real estate and annual returns from real estate shares suggests that de-gearred real estate share returns have useful information content that could help understand performance in the direct real estate market. It is shown that when direct real estate data are unsmoothed, measures of dependency between the direct and the de-gearred indirect market strengthen considerably, and if it is assumed that unsmoothed direct real estate returns better reflect underlying transaction prices than direct real estate data, the results suggests that data from the market for real-estate shares could be useful for filling the gaps in direct market series.

ACCOUNTING METHODS OF VALUATION:

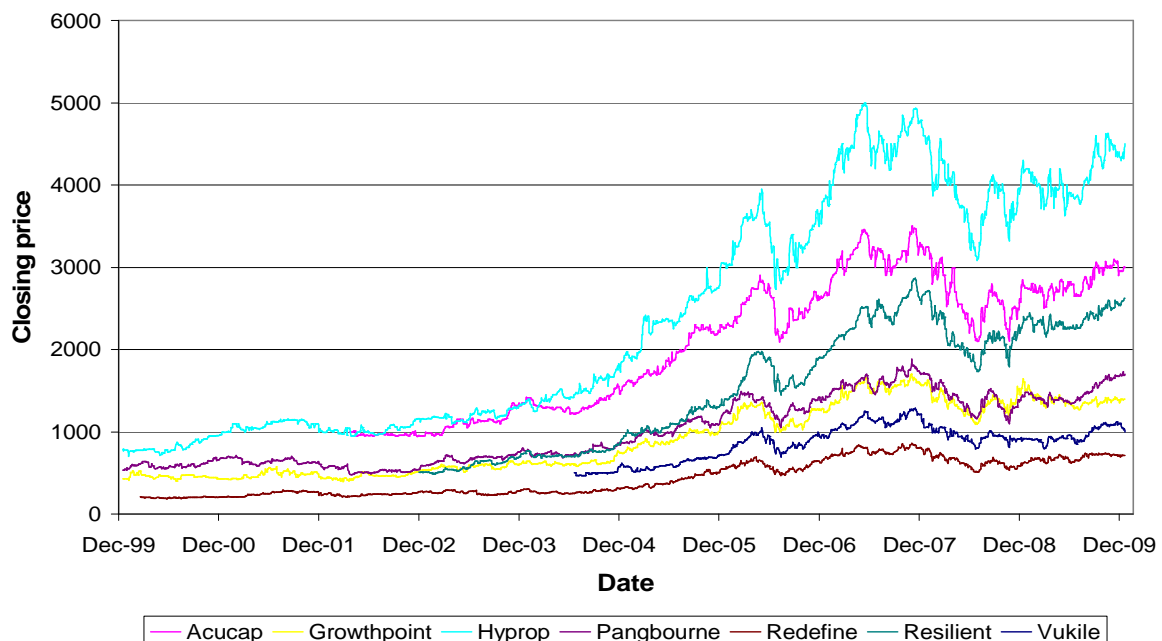
The listed property market in South Africa consists of Property Loan Stock companies, and Real Estate Investment Trusts, previously Property Unit Trust funds. There are 21 Property Loan Stock companies, with a total market capitalization of R75,922,000,000, which is a combination of different property types, locations, and classes. 90% of this is held by the 7 companies that are included in this study. The PLS sector makes up approx. 4.1% of the Financial sector of which it forms part, and .8% of the JSE.

The daily share prices of the different PLS companies are shown in figure 1, the similar movement for the various funds is very obvious and is an indication that it might be external factors that drives the volatility of the shares, i.e. general economic conditions, or stock market confidence, rather than specific company variables.

The movement of the share prices, and ultimately the market capitalization of the different companies could be investigated by way of relative comparison, using the accounting method of valuation. It involves the comparison of the different accounting ratio's as performance indicators to the same ratios of other companies, thereby providing a base for comparison of share performance. The financial ratios are divided into five categories:

1. Common size statement
2. Internal liquidity (solvency)
3. Operating performance
 - a. Operating efficiency
 - b. Operating profitability
4. Risk analysis
 - a. Business risk
 - b. Financial risk
 - c. Liquidity risk
5. Growth analysis

Figure 1: Daily share prices of PLS companies



The significance of these ratios is tested by correlating each ratio to the share price performance. A high positive correlation would indicate that the specific ratio is a good indicator of value driver with a positive relationship, i.e. when the ratio increase it will motivate investors to purchase the share at a higher price, while a high negative correlation indicates that an increase in the ratio would de-motivate investors to purchase the share and subsequently the price of the share would fall. A low correlation would indicate that an investor is indifferent on the movement of the ratio when taking a decision to buy or sell shares. The correlation of the individual companies' share prices to their respective ratios are determined, but is also combined to obtain the correlation of share prices to accounting ratios in general.

Table 1 provides the correlation coefficients for the different variables to the year end closing price of each company.

Table 1: Correlation of accounting ratios with closing share prices of PLS companies

	Acucap	Growth-point	Hyprop	Pang-bourne	Redefine	Resilient	Vukile	Combined
Current ratio	-.818*	-.698*	.097	.247	.246	-.459	.522	-.207
Debt-assets ratio	-.979**	-.738*	-.804**	-.907**	-.974**	-.622	-.826	-.619**
Debt-equity ratio	-.798*	.322	-.620	-.925**	-.659	-.616	-.916*	-.130
Net profit margin	.079	-.464	.469	.501	.878	-.534	.875	.300*
Operating profit margin	.036	-.628	.417	.346	.926*	-.445	.867	.383**
Quick ratio	-.817*	-.560	.097	.008	.246	-.496	.257	-.221
Return on assets	-.291	-.816**	-.034	-.050	.120	-.770	.026	.022
Return on capital employed	-.881**	-.482	.035	-.021	-.632	-.973**	-.788	-.245
Return on equity	-.838*	-.728*	-.845**	-.573	-.329	-.789	. ^a	-.717**
Total assets turnover	-.011	-.483	.233	.515	-.003	-.755	-.162	.060

**Correlation is significant at the .01 level

*Correlation is significant at the .05 level

a. Cannot be computed because at least one of the variables is constant.

From table 1 it is evident that some of the ratios do provide a high level of correlation with the closing share price, but the correlation is not consistent for all companies. Where this is the case the relevance of such a correlation is questionable. Variables that show a fair degree of consistency, as well as a high degree of correlation with combined data, are debt-assets ratio and return on equity.

Table 2 consists of the same ratios, but the correlation is tested to the weighted average share price for the year, rather than the closing price.

Table 2: Correlation of accounting ratios with weighted average share prices of PLS companies

	Acucap	Growth-point	Hyprop	Pang-bourne	Redefine	Resilient	Vukile	Combined
Current ratio	-.828*	-.665*	.066	.178	.292	-.467	.214	-.217
Debt-assets ratio	-.850*	-.618	-.788*	-.966**	-.941**	-.620	-.938*	-.600**
Debt-equity ratio	-.718	.044	-.609	-.930**	-.615	-.617	-.881*	-.163
Net profit margin	-.123	-.354	.412	.657*	.215	-.534	-.257	.253
Operating profit margin	-.173	-.583	.354	.539	.370	-.445	-.273	.325*
Quick ratio	-.828*	-.416	.066	-.038	.292	-.505	-.033	-.220
Return on assets	-.480	-.748*	-.092	-.058	-.043	-.761	-.521	-.052
Return on capital employed	-.885**	-.391	-.005	-.064	-.726*	-.966**	-.911*	-.276*
Return on equity	-.846*	-.676*	-.829**	-.733*	-.715	-.777	. ^a	-.720**
Total assets turnover	-.205	-.386	.183	.536	-.179	-.746	-.634	.009

**Correlation is significant at the .01 level

*Correlation is significant at the .05 level

a. Cannot be computed because at least one of the variables is constant.

Again the same ratios as with the closing price correlation test, being debt-assets ratio and return on equity, stands out to show fairly consistent high degrees of correlation on the individual company data as well as the combined data.

In both the correlation tests, the negative correlation between the share price and the return on equity might come as a surprise, normally the higher the return on equity, the more effective is the company on its assets, and the higher the share price would be. In order to explain this reversed situation, consideration should be given to general valuation principles for income producing properties, which is the capitalization of the first year's income to calculate the value of the property. This is done by the formula:

$$\text{Value} = \text{Net income} / \text{Capitalization rate}$$

If this is rewritten in the format to determine the capitalization rate it is:

$$\text{Capitalization rate} = \text{Net income} / \text{Value}$$

If it is compared to the return on equity ratio, it can be seen that it is in the same format, with the total return to equity holders divided by the total value or price of the shares of the company.

This indicates that the lower the ratio of income to the asset value, the lower the capitalization rate, or the lower the return attributable to equity holders as percentage of the price paid for the share, the lower the return on equity ratio. The capitalization rate in the property sector is however a measure of risk, indicating that the lower the rate, the higher the confidence of the investor that the specific asset will provide the cash flow as foreseen. Due to the fact that the PLS sector consist of a portfolio of properties, and therefore the income is the sum of the rental streams of these properties, it is therefore expected that the share price will increase as the confidence of the investors that the assets will deliver the required cash flow, increase. Therefore investors are prepared to pay higher prices for the shares for a given amount of return, if they perceive the risk to decrease.

It can therefore be concluded that with PLS companies, the return on equity ratio is not an efficiency ratio as with manufacturing and other firms, but rather a confidence ratio, that will have a negative correlation to the share price of the company.

The negative correlation of the share prices with the debt-assets ratio is an indication that investors are seeing the higher debt levels as a risk to their investment, and therefore are not prepared to pay more for shares as debt increases. This indicates that the debt levels are above the optimum debt level. The structure of the PLS companies make it difficult to analyse this variable accurately, as the total debt also includes the debentures which forms part of the investment of the shareholders. Therefore this ratio should be carefully considered taking into consideration the share capital, debenture and other debt structures of each company, i.e. Growthpoint has the highest level of debt at 95.6% and then Vukile at 75.8%, yet Vukile has the third highest correlation between debt-equity ratio and share price (-.938 at the 95% confidence level), while Growthpoint has a correlation of -.618 but below the 95% confidence level. It is evident that the debt-equity ratio is not the primary driver of share prices, and reliance is put on other factors as well. Investors seem insensitive for debt at higher levels, and therefore the debt structure of each company should be considered in more detail to get a conclusive result on this ratio. It should however be mentioned that Growthpoint is the largest of the PLS companies, while Vukile is a much smaller and volatile company. This confirms that investors would consider more than a single variable to make decisions, and would consider companies in accordance with their risk profiles.

From the above it is presumed that, although some significant correlations are observed, the valuation of listed property funds does not entirely rely on accounting returns, and therefore confirms the criticism of various authors on the method (Van Heerden de Wet, 2004; Stewart, 1991; Ehrbar, 1998; Copeland et al. 1996), and that reliance for value in this sector might have to be put on other variables.

CORRELATION OF SHARE PRICE WITH FINANCIAL STATEMENTS:

In order to test the reliance of the share price of the PLS companies on variables other than the accounting ratios, the share prices of the seven PLS companies under consideration is correlated with its financial statements, i.e. the balance sheet and income statements. The results of this can be seen in tables 3 to 6:

Table 3: Correlation of balance sheet with closing share prices of PLS companies

	Acucap	Growth-point	Hyprop	Pang-bourne	Redefine	Resilient	Vukile	Combined
ASSETS	.843**	.907**	.992**	.751*	.949**	.922**	.981**	.358**
Fixed Assets	.855**	.911**	.978**	.703*	.918**	.901**	.979**	.331**
Current Assets	.408	.622	.693*	.696*	.837**	.696*	.880**	.218
Non Current Assets	.515	.472	.851**	.399	.445	.a	.559	.317**
Intangible Assets	.330	.486	.a	.780**	.a	.456	.964**	.047
EQUITY	.829**	.513	.995**	.779**	.927**	.899**	.921**	.655**
Ordinary S.H. Interest	.829**	.513	.979**	.760*	.927**	.898**	.914**	.614**
Outside S.H. Interest	.a	.a	.639*	.306	.445	.a	.149	.564**
LIABILITIES	.836**	.904**	.970**	.749*	.950**	.921**	.973**	.243*
Current Liabilities	.579	.779**	.983**	.601	.908**	.763*	.945**	.253*
Deferred Tax	.947**	.485	.993**	.604	.905**	.973**	.939**	.748**
Long Term Liabilities	.861**	.905**	.939**	.817**	.946**	.902**	.958**	.174

**Correlation is significant at the .01 level

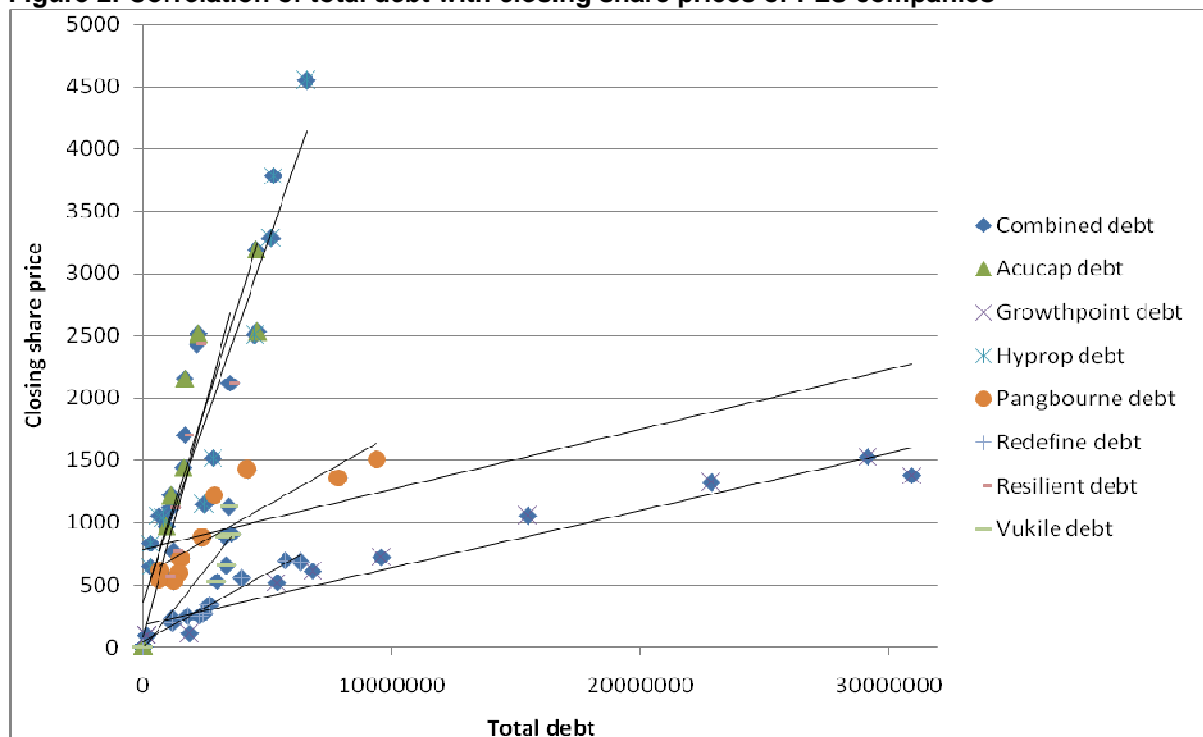
*Correlation is significant at the .05 level

a. Cannot be computed because at least one of the variables is constant.

When considering the correlations in table 3, the share prices show very significant correlations to the different balance sheet items, with the most consistently high correlations as well as the highest correlations for combined data being assets, fixed assets, equity, ordinary shareholders interest and deferred tax. Although the main operation of these companies is property investment and one could expect a close correlation of the share price with fixed assets, the correlation with total assets is higher, indicating that shareholders recognize other assets also important. Total liabilities also provide correlations that are similar to the correlation with assets, yet the correlation of the combined data in both these cases shows a much weaker situation. This is explained by figure 2, with debt as example, where regression lines of the individual companies could be seen, compared to the combined situation.

From the close correlation that could be seen in the individual company's regression lines, it could be deduced that the share prices are explained to a large degree by the debt levels in the various companies, but the large differences in slope of these regression lines, it is concluded that debt could not be seen as a primary driving factor for share prices in general, and therefore in order to explain share price movement, other factors should also be considered.

Figure 2: Correlation of total debt with closing share prices of PLS companies



Equity has also shown a high level of correlation for all the companies, but with a higher level of correlation for the combined data than with the other variables. This is expected due to the fact that the equity is the company's representation of the value of the combined shares, and is a confirmation that the share price, being the market's interpretation of equity value, follows the financial statements' or directors' indication of equity value.

Table 4 provides the closing share price as it correlates with the income statement items. A fair degree of consistent high correlation for various items is evident, but again there is a number of variables that correlates very well for company specific data, but have a substantial lower correlation for combined data. This is especially visible for the turnover figures, and is represented in figure 3.

It is however noticeable that the profit items are having higher correlations than the items that includes expenses. Operating profit, E.B.I.T. and E.B.I.T.D.A. is the highest correlating variables for the combined data, with equally high correlations for the individual companies. This would suggest a high consideration for the returns of the companies in share price determination.

Table 4: Correlation of income statement with closing share prices of PLS companies

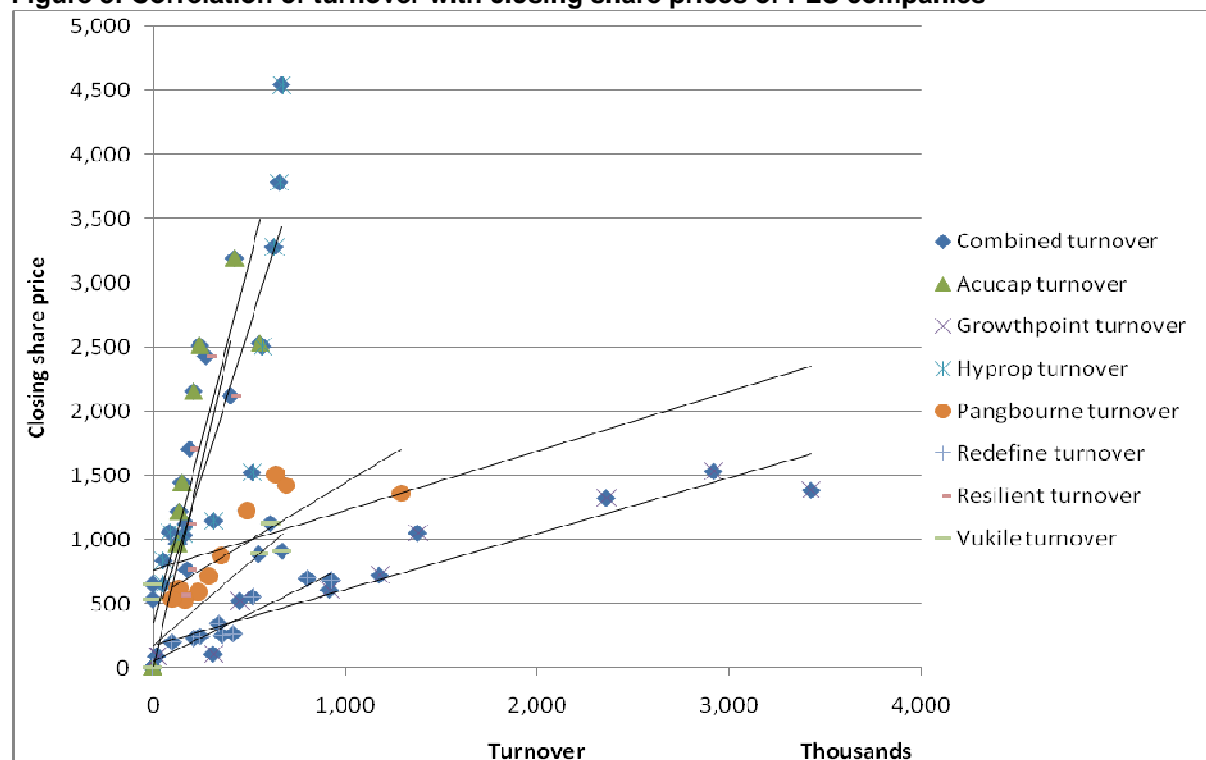
	Acucap	Growth-point	Hyprop	Pang-bourne	Redefine	Resilient	Vukile	Combined
Turnover	.837**	.892**	.911**	.832**	.919**	.927**	.774**	.254*
Operating Profit	.870**	.877**	.833**	.659*	.844**	.897**	.968**	.573**
Interest Received	.616	.678*	.710*	.543	.695*	.662*	.931**	.312**
Total Income	.893**	.879**	.843**	.652*	.856**	.939**	.970**	.577**
Total Cost Shown	.470	.504	.946**	-.142	.152	.790**	.965**	.102
E.B.I.T.	.893**	.892**	.842**	.686*	.855**	.937**	.969**	.583**
Interest & Finance Charges	.799**	.879**	.965**	.780**	.911**	.915**	.981**	.283*
Profit before Tax	.458	-.411	.757*	.340	.564	.785**	.862**	.549**
Taxation	.501	-.077	.619	.323	.599	.632*	.764*	.512**
Profit After Int. and Tax	.439	-.484	.792**	.339	.483	.823**	.880**	.540**
E.B.I.T.D.A.	.891**	.887**	.843**	.714*	.836**	.938**	.969**	.562**

**Correlation is significant at the .01 level

*Correlation is significant at the .05 level

a. Cannot be computed because at least one of the variables is constant.

Figure 3: Correlation of turnover with closing share prices of PLS companies



Tables 5 and 6 consider the correlation to the various companies' balance sheets and income statements respectively to the average share prices for the year opposed to the closing share price as seen in tables 3 and 4.

The financial statement items shows more consistent correlations with the weighted average share prices than with the correlation to the closing price of the company shares. It is also notable that the correlations are higher also for the combined data for the average share price than with the closing price. The items showing best correlations are however similar to those identified for the closing share price, and the tendencies are also similar, for the same reasons as mentioned earlier. The correlations however seems to provide a slightly stronger explanation on share prices than did the accounting ratios. This statement could however not be stated conclusively.

Table 5: Correlation of balance sheet with weighted average share prices of PLS companies

	Acucap	Growth-point	Hyprop	Pang-bourne	Redefine	Resilient	Vukile	Combined
ASSETS	.918**	.973**	.984**	.871**	.973**	.928**	.979**	.409**
Fixed Assets	.930**	.974**	.968**	.833**	.941**	.908**	.978**	.379**
Current Assets	.401	.660*	.717*	.841**	.870**	.695*	.808**	.272*
Non Current Assets	.650*	.685*	.878**	.267	.524	^a	.693*	.374**
Intangible Assets	.338	.678*	^a	.665*	^a	.469	.930**	.100
EQUITY	.898**	.700*	.992**	.890**	.944**	.911**	.963**	.689**
Ordinary S.H. Interest	.898**	.700*	.978**	.870**	.944**	.909**	.957**	.651**
Outside S.H. Interest	^a	^a	.629	.532	.524	^a	.135	.553**
LIABILITIES	.913**	.971**	.959**	.872**	.980**	.922**	.958**	.291*
Current Liabilities	.736*	.803**	.976**	.766**	.936**	.771**	.902**	.319**
Deferred Tax	.948**	.679*	.993**	.755*	.927**	.980**	.952**	.766**
Long Term Liabilities	.913**	.974**	.924**	.913**	.976**	.900**	.942**	.219

**Correlation is significant at the .01 level

*Correlation is significant at the .05 level

a. Cannot be computed because at least one of the variables is constant.

Table 6: Correlation of income statement with weighted average share prices of PLS companies

	Acucap	Growth-point	Hyprop	Pang-bourne	Redefine	Resilient	Vukile	Combined
Turnover	.892**	.952**	.890**	.818**	.953**	.924**	.843**	.298*
Operating Profit	.836**	.946**	.814**	.815**	.779**	.886**	.911**	.594**
Interest Received	.644*	.715*	.743*	.732*	.761*	.676*	.929**	.364**
Total Income	.864**	.947**	.825**	.812**	.793**	.931**	.913**	.601**
Total Cost Shown	.428	.686*	.935**	-.098	.199	.788**	.986**	.127
E.B.I.T.	.864**	.953**	.824**	.845**	.792**	.929**	.911**	.605**
Interest & Finance Charges	.849**	.947**	.951**	.824**	.954**	.915**	.976**	.330**
Profit before Tax	.368	-.599	.739*	.513	.456	.774**	.759*	.533**
Taxation	.398	-.156	.606	.450	.575	.615	.631	.496**
Profit After Int. and Tax	.356	-.688*	.772**	.524	.360	.814**	.789**	.525**
E.B.I.T.D.A.	.863**	.955**	.825**	.865**	.773**	.930**	.911**	.584**

**Correlation is significant at the .01 level

*Correlation is significant at the .05 level

a. Cannot be computed because at least one of the variables is constant.

If we consider that the share price of a company is only the price paid for a single share, but the financial statements consider the company as a whole, i.e. all issued shares, consideration should also be given to the market capitalization of the companies, i.e. the latest share price multiplied by the number of shares in issue. Although this is not strictly speaking the correlation of the share price with financial statements, it is the total value of the company as per the daily share price movement.

Due to the higher correlation of weighted average share prices to all different variables, it is expected that the weighted average market capitalization (weighted average share price multiplied by weighted average number of shares) would also provide higher correlations with the different variables in question than the closing market capitalization. This was tested and confirmed to be the situation, but is not shown here. Subsequently only the weighted average market capitalization of each company is

considered to the extent that it correlates with the financial statements of the companies. The results of this are shown on table 7 and 8.

Table 7: Correlation of balance sheet with weighted average market capitalization of PLS companies

	Acucap	Growth-point	Hyprop	Pang-bourne	Redefine	Resilient	Vukile	Combined
ASSETS	.997**	.993**	.984**	.969**	.996**	.989**	.962**	.983**
Fixed Assets	.996**	.992**	.968**	.950**	.995**	.982**	.960**	.976**
Current Assets	.357	.801**	.684*	.936**	.957**	.782**	.793**	.598**
Non Current Assets	.879**	.749*	.867**	.104	.670*	^a	.741*	.743**
Intangible Assets	.573	.839**	^a	.489	^a	.696*	.934**	.776**
EQUITY	.992**	.855**	.994**	.977**	.994**	.992**	.980**	.437**
Ordinary S.H. Interest	.992**	.855**	.993**	.973**	.994**	.992**	.976**	.445**
Outside S.H. Interest	^a	^a	.568	.541	.670*	^a	.047	.119
LIABILITIES	.986**	.994**	.948**	.965**	.980**	.962**	.932**	.970**
Current Liabilities	.885**	.822**	.982**	.893**	.982**	.911**	.887**	.794**
Deferred Tax	.913**	.838**	.989**	.906**	.984**	.973**	.971**	.429**
Long Term Liabilities	.967**	.994**	.921**	.986**	.961**	.926**	.909**	.953**

**Correlation is significant at the .01 level

*Correlation is significant at the .05 level

a. Cannot be computed because at least one of the variables is constant.

Table 8: Correlation of income statement with weighted average market capitalization of PLS companies

	Acucap	Growth-point	Hyprop	Pang-bourne	Redefine	Resilient	Vukile	Combined
Turnover	.968**	.991**	.884**	.927**	.966**	.937**	.877**	.965**
Operating Profit	.688*	.987**	.770**	.792**	.682*	.737*	.878**	.764**
Interest Received	.831**	.639*	.742*	.837**	.879**	.858**	.935**	.707**
Total Income	.744*	.981**	.782**	.802**	.700*	.812**	.880**	.782**
Total Cost Shown	.325	.850**	.936**	.073	.176	.758*	.980**	.475**
E.B.I.T.	.745*	.979**	.780**	.812**	.699*	.810**	.878**	.772**
Interest & Finance Charges	.950**	.982**	.961**	.957**	.992**	.960**	.961**	.969**
Profit before Tax	.099	-.793**	.684*	.379	.311	.587	.712*	.094
Taxation	.139	-.422	.536	.257	.507	.381	.596	.109
Profit After Int. and Tax	.083	-.827**	.725*	.411	.207	.646*	.739*	.085
E.B.I.T.D.A.	.742*	.983**	.781**	.825**	.702*	.810**	.878**	.764**

**Correlation is significant at the .01 level

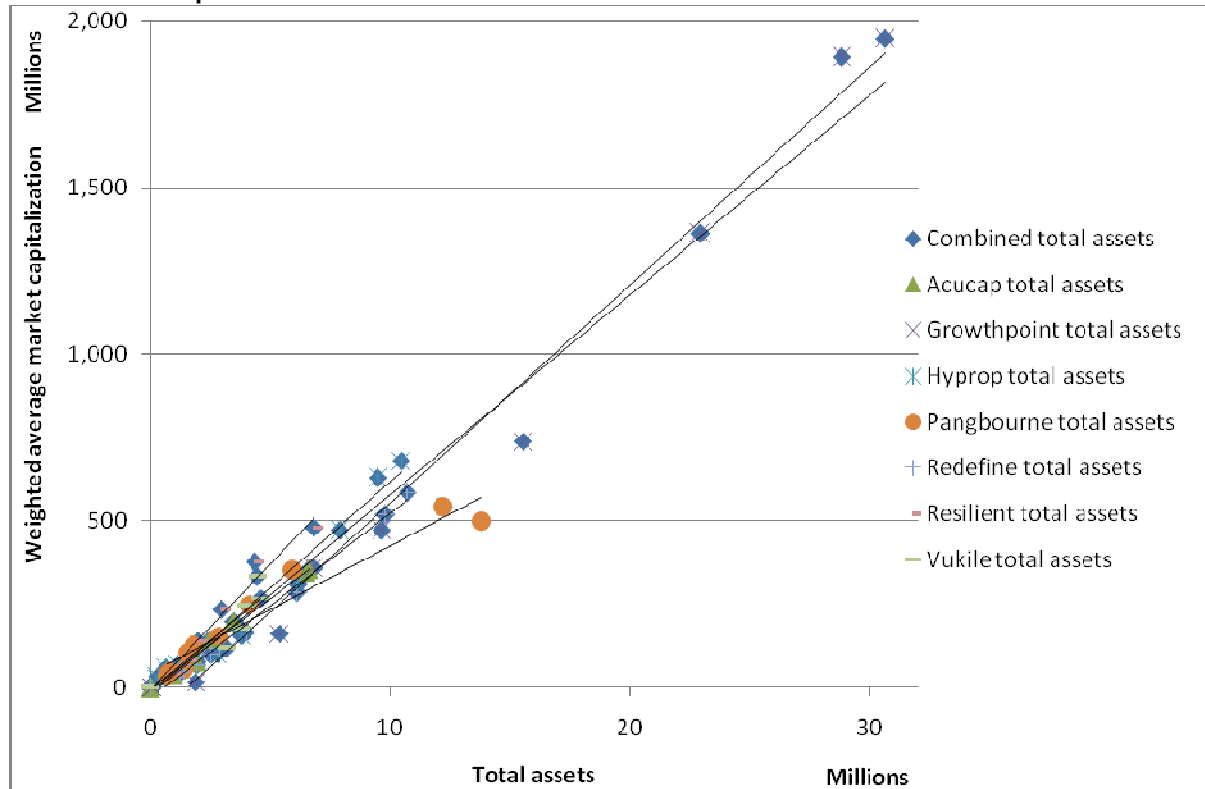
*Correlation is significant at the .05 level

a. Cannot be computed because at least one of the variables is constant.

The correlation of the weighted average market capitalization with the balance sheet and income statement of each respective company shows levels of consistent correlation that is substantially higher than that of the correlation with the weighted average share prices. What is however of interest is that in these two tables, the variables that had the largest discrepancies between individual company and combined data, is now showing the highest correlations for the combined data, which is also substantially higher than any correlations found in the test for correlation with singles share prices, or accounting ratios .

The variable with the highest correlation is total assets. This is indicated by figure 4, where the similar slope in the regression lines for all the companies is very clear. This is a clear indication that shareholders take a combined look at the company as a whole when making individual share price decisions. Shareholders are therefore reacting on the actions of all other investors, and are comparing the sum of all shares to the value of the company's assets. This furthermore is a very clear indication that the total sum of all shares as seen by market activity, is in line with the market's expectations of the total assets of the company. An interesting deduction is that the correlations on the combined data for the balance sheet is higher than the correlations in the income statement, therefore it seems as if investors are putting emphasis on the assets, and the fact that they are purchasing a share in a portfolio of properties, then the actual return that they will receive.

Figure 4: Correlation of total assets with weighted average market capitalization of PLS companies



In summary, the correlations of normal financial statement items to the share prices of the PLS companies seems to have slightly better correlation than that of the accounting ratio's and share prices of these companies. There is also a slightly higher correlation between the weighted average share price for the year and the financial statement items, than between the closing share price and the financial statements, indicating that investors are considering the operations of the company in the long term, and the share price that fluctuates daily, are doing so within the boundaries that are created by the essentials of the company, being the variables on the financial statements. This confirms the presumption that PLS companies are unique in the sense that its balance sheet items, or assets in itself is the investment, rather than the operations of the company as found with other JSE listed companies.

The correlation of the weighted average market capitalization with the financial statement items is however of more reliance than the individual share prices. The accounting ratio's provide information on the company's performance, but as ratios it provide info that is significant to individual shares, while the financial statements provides info on the company as a whole, and should therefore be considered in relation to the market capitalization. The long term market capitalization of these companies is therefore a good indication of how investors are viewing these companies, and with the high correlation to total assets, is also a good indication of the values of the properties underlying the balance sheet, hence also the direct property market.

CORRELATION OF SHARE PRICE WITH THE JSE

In the previous section it was indicated that a high level of correlation exist between the financial statements and the market capitalization of the shares of such a company. It is also evident that the correlation exist in a similar way for all companies, and that the total market capitalization could be accurately predicted by considering the balance sheet of the companies. This ultimately is influenced by investors in the price they are prepared to pay for the shares, taking into consideration the number of shares that is issued. Equally the value of the underlying assets could be predicted by considering the going share price, multiplied by the total number of shares issued.

If we however again consider figure 1, there are much fluctuations in the share price, and subsequently in the market capitalization of the shares between year end dates, when information on

company performance becomes available to shareholders and prospective investors. It is presumed that shareholders cannot have sufficient information on the individual companies that could drive them to make buy and sell decisions on a daily basis that could cause such high fluctuations in the market. In this section the fluctuations in the share prices will be considered in order to resolve this question.

When the share prices of the different companies are viewed as per figure 1 it can be seen that the prices are moving in a very similar way. It is therefore presumed that the cause of the fluctuations is affecting the companies alike, and should therefore be of an external nature, rather than originating from variables within the company itself.

As part of the PLS sector, which in turns forms part of the financial sector and the overall JSE, the share prices are compared to various indexes in order to explain the fluctuations. The indexes under consideration are the following:

- the J253 **SA Property Index**;
- the J256 **Property Loan Stock Index**;
- the J203 **All Share Index**;
- and the J580 **Financials Index**.

If this is correlated to the individual share prices, the results are as follows:

Table 9: Correlation of JSE indices with weighted average share prices of PLS companies

	Acucap	Growth-point	Hyprop	Pang-bourne	Redefine	Resilient	Vukile	Combined
J253 SA Property	.989**	.987**	.991**	.982**	.991**	.965**	.980**	.996**
J256 PLS	.990**	.995**	.997**	.988**	.991**	.990**	.976**	.998**
J203 All Share	.931**	.928**	.944**	.929**	.941**	.931**	.909**	.936**
J580 Financials	.938**	.926**	.935**	.941**	.938**	.858**	.866**	.927**

**Correlation is significant at the .01 level

*Correlation is significant at the .05 level

a. Cannot be computed because at least one of the variables is constant.

The high correlation with the J253 and J256 is expected, as the companies that are considered form a major part of these indexes. As said earlier, the seven companies under consideration makes up 90% of the PLS sector, and therefore the index is just a reflection of the sum of these companies. Therefore the combined correlation between the companies and the index should be very close. It could be argued that this is also the case with the Financial and All share indexes, but if it is taken into consideration that the PLS sector makes up only 4.1% of the Financial sector and .8% of the JSE, a change in a single company, or even in the PLS sector as a whole will not have any significant effect on the two respective indexes. It is therefore stated that the influence is the other way round, with fluctuations in the share price of individual PLS companies being influenced by general JSE sentiment, and not by anything caused by company operations. This confirms that irrational behaviour of investors is equally applicable to property shares than to other listed shares, and provides the opportunity to further investigate behavioural finance theory on property investment. If the principles of behavioural finance could be applied to property shares, a lot could be learnt from the listed property sector which, due to the correlations that was seen earlier in this paper between property shares and the underlying assets, could be applied to direct property investment as well.

CORRELATION OF SHARE PRICE WITH ECONOMY

In the previous section it was shown that the fluctuations in the share prices of PLS companies are caused largely due to the JSE sentiment, i.e. factors affecting the JSE as a whole, rather than the operations of the companies itself, although the long term growth in shareprices could be determined by the growth in assets, divided by the number of shares issued. It should however be asked, what is driving the growth of the PLS companies in the long term? Why are PLS companies growing and what causes the long term increase in balance sheet and therefore share prices. If the driving forces in the long term growth can be identified it is also possible to determine the extent that these companies are likely to grow in the long term, and what fundamentals to address, or opportunities to explore in order to excel. It furthermore could provide a link to predict market capitalization movement within a specific framework, from where the value of the underlying assets could be predicted.

With these questions, the share prices, market capitalization and balance sheets of the case study is compared to various macro economic variables. The main drivers of the economy that is tested are the following:

- Total employment in the private sector
- Total employment in the Public sector
- Total employment in the Non-agricultural sector
- Disposable income of households
- Ratio of saving by households to disposable income of households
- Total national government debt as % of GDP
- National government revenue as percentage of GDP
- National government expenditure as percentage of GDP
- Gross domestic product at market prices (GDP)
- Gross value added at basic prices of construction (contractors) (GDP)
- Repo rate

The correlation of these variables with the individual companies' Share prices, Number of shares and Market capitalization is indicated in tables 10 to 12.

The correlations show various items that have high correlations with the share prices, number of shares and market capitalization of the companies. It is however clear that the correlation of all the items with the number of shares issued and market capitalization of Redefine is substantially lower than the other PLS companies.

Upon investigation it was revealed that Redefine had a substantial increase in market capitalization during 2009, due to a merge with two other PLS companies, and is therefore providing a distorted view of the real situation, as the financial information of the other funds prior to the merge is not taken into consideration.

Table 10: Correlation of economic factors with closing share prices of PLS companies

	Acucap	Growth-point	Hyprop	Pang-bourne	Redefine	Resilient	Vukile	Combined
Total employment in the private sector	.869**	.883**	.885**	.879**	.860**	.945**	.827**	.893**
Total employment in the Public sector	.859**	.888**	.898**	.856**	.873**	.930**	.748**	.891**
Total employment in the Non-agricultural sector	.881**	.897**	.900**	.890**	.874**	.947**	.822**	.906**
Disposable income of households	.863**	.893**	.898**	.869**	.867**	.912**	.700**	.897**
Ratio of saving by households to disposable income	-.920**	-.915**	-.929**	-.910**	-.911**	-.888**	-.820**	-.927**
Total national government debt as % of GDP	-.840**	-.878**	-.882**	-.851**	-.849**	-.901**	-.719**	-.880**
National government revenue as % of GDP	.732**	.719**	.725**	.721**	.721**	.634**	.522**	.720**
National government expenditure as % of GDP	.326**	.318**	.332**	.305**	.298**	.331**	.200**	.325**
Gross domestic product at market prices (GDP)	.852**	.884**	.891**	.858**	.862**	.909**	.686**	.888**
Gross value added at basic prices of construction (GDP)	.824**	.858**	.861**	.833**	.828**	.894**	.681**	.861**
Repo	-.296**	-.203**	-.227**	-.297**	-.195**	-.002	.440**	-.258**

**Correlation is significant at the .01 level

*Correlation is significant at the .05 level

a. Cannot be computed because at least one of the variables is constant.

Table 11: Correlation of economic factors with number of shares of PLS companies

	Acucap	Growth-point	Hyprop	Pang-bourne	Redefine	Resilient	Vukile	Combined
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Total employment in the private sector	.843**	.847**	.898**	.753**	.570**	.863**	.811**	.817**
Total employment in the Public sector	.981**	.948**	.901**	.905**	.670**	.940**	.745**	.910**
Total employment in the Non-agricultural sector	.869**	.869**	.911**	.779**	.588**	.876**	.807**	.840**
Disposable income of households	.974**	.950**	.935**	.919**	.674**	.955**	.723**	.921**
Ratio of saving by households to disposable income	-.798**	-.803**	-.889**	-.629**	-.473**	-.696**	-.719**	-.745**
Total national government debt as % of GDP	-.969**	-.947**	-.900**	-.908**	-.682**	-.933**	-.690**	-.915**
National government revenue as % of GDP	.507**	.532**	.633**	.285**	.265**	.352**	.525**	.469**
National government expenditure as % of GDP	.335**	.375**	.337**	.310**	.302**	.380**	.179**	.367**
Gross domestic product at market prices (GDP)	.987**	.960**	.928**	.933**	.696**	.967**	.708**	.933**
Gross value added at basic prices of construction (GDP)	.962**	.949**	.904**	.907**	.681**	.962**	.698**	.915**
Repo	-.037	-.210**	-.343**	.015	-.250**	-.022	.450**	-.261**

**Correlation is significant at the .01 level

*Correlation is significant at the .05 level

a. Cannot be computed because at least one of the variables is constant.

Table 12: Correlation of economic factors with market capitalization of PLS companies

	Acucap	Growth-point	Hyprop	Pang-bourne	Redefine	Resilient	Vukile	Combined
Total employment in the private sector	.860**	.879**	.896**	.843**	.635**	.909**	.866**	.864**
Total employment in the Public sector	.970**	.970**	.941**	.962**	.740**	.965**	.795**	.957**
Total employment in the Non-agricultural sector	.883**	.901**	.913**	.867**	.655**	.919**	.862**	.887**
Disposable income of households	.955**	.962**	.940**	.968**	.732**	.961**	.750**	.953**
Ratio of saving by households to disposable income	-.844**	-.857**	-.920**	-.776**	-.576**	-.753**	-.832**	-.837**
Total national government debt as % of GDP	-.954**	-.962**	-.923**	-.956**	-.736**	-.961**	-.765**	-.947**
National government revenue as % of GDP	.588**	.596**	.695**	.477**	.371**	.445**	.530**	.577**
National government expenditure as % of GDP	.337**	.347**	.341**	.349**	.313**	.373**	.209**	.355**
Gross domestic product at market prices (GDP)	.966**	.971**	.939**	.977**	.752**	.974**	.736**	.962**
Gross value added at basic prices of construction (GDP)	.938**	.946**	.908**	.951**	.732**	.973**	.731**	.935**
Repo	-.081**	-.120**	-.196**	-.106**	-.230**	.041	.478**	-.167**

**Correlation is significant at the .01 level

*Correlation is significant at the .05 level

a. Cannot be computed because at least one of the variables is constant.

The combined correlations are indicated in table 13, from where it is possible to compare the correlations to each other.

Table 13: Most relevant economic correlations

	Closing price	No of shares	Market cap
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Total employment in the private sector	.893**	.817**	.864**
Total employment in the Public sector	.891**	.910**	.957**
Total employment in the Non-agricultural sector	.906**	.840**	.887**
Disposable income of households	.897**	.921**	.953**
Ratio of saving by households to disposable income	-.927**	-.745**	-.837**
Total national government debt as % of GDP	-.880**	-.915**	-.947**
National government revenue as percentage of GDP	.720**	.469**	.577**
National government expenditure as % of GDP	.325**	.367**	.355**
Gross domestic product at market prices (GDP)	.888**	.933**	.962**
Gross value added at basic prices of construction (GDP)	.861**	.915**	.935**
Repo	-.258**	-.261**	-.167**

**Correlation is significant at the .01 level

*Correlation is significant at the .05 level

a. Cannot be computed because at least one of the variables is constant.

From the above, it is evident that the highest correlations are with the market capitalization of the PLS companies. Variables that are clearly significant is that of the employment levels, which is not surprising, due to the fact that with higher employment comes more requirements for place to work, and subsequently higher levels of property investment, being retail, commercial or industrial, and subsequently the increase in market share growth for property.

The highest correlation is however that of gross domestic product (GDP) as it correlates with market capitalization. GDP growth is generally seen as one of the most important indicators of economic growth, and would subsequently also influence the demand for property. With an increase in economic activity, firms are in more need of real estate space to provide manufacturing, goods and services. It is notable that GDP also correlates very closely with the number of shares issued, being an indication of the expansion of the PLS companies, not taking into consideration the price level increases of the shares. Although not shown in the tables above, the three company variables were also tested against real GDP, and the results were that market capitalization is correlating slightly lower at .957**, and number of shares issued slightly higher at .967**. This confirms that the company growth is determined by GDP growth, but the market capitalization and GDP both includes general price level increases, while number of shares issued is an indication of real growth in the company. This last statement could however be distorted by share splits, or combinations.

Another important measure is that of gross value added at basic prices of construction. A positive correlation is expected due to the fact that an increase in property demand would initiate construction. The growth in property investment as seen in the increase in market capitalization of property shares, drives the construction levels, and therefore this variable is not considered to be a driver of property investment, being direct or indirect, other than stock adjustment and subsequent influence on demand / supply equilibrium (DiPasquale et al, 1992), but is the dependent variable.

The correlation of disposable income of households to the market capitalization of shares is also very significant. The disposable income of households is expected to increase with an increase in GDP as per general macro economic theory (Case et al, 1999). The one explanation are therefore that both market capitalization and disposable income is dependant variables on GDP. The second explanation would be that households are increasing investment with an increase in disposable income, causing an increase in investment levels also in the direct and indirect property market.

Correlations that were found to be much less reliable are that of National Government revenue as percentage of GDP, National Government expenditure as percentage of GDP, and the Repo rate.

The highest negative correlation is that of total national government debt as percentage of GDP to market capitalization. This indicates that the effective use of government debt is a very important driver of the economy, and ultimately the property market. If government is increasing its debt levels quicker than the expansion of the GDP, it is destroying value and therefore total market value levels of property is diminishing.

Another notable correlation is that of the ratio of savings by households to disposable income of households that shows significant negative correlations to the share prices of the PLS companies.

This specific economic variable correlates even higher with the all share index at $-.942^{**}$. GDP consist of household consumption, investment spending by firms, government expenditure and net exports, therefore an increase in household consumption would increase GDP. Over the past 20 years disposable income decreased from an average level of approx. 65% to approx. 62% of GDP. Although it is a slightly negative trend, it does not appear to be drastic. If it is considered that disposable income consists of consumption by households and savings, it is deducted that if disposable income is stable, an increase in consumption spending by households should be funded from savings. In the same period mentioned, this was exactly the case, that households saved less and less while consumption is increasing. This has the effect of an increase in GDP, which is explained earlier to cause an increase in direct and indirect real estate investment prices, at the cost of reduced savings. Therefore although this clear negative correlation is evident from the case study, it is not an occurrence that would always exist, and not to be seen as a reliable indicator of performance of shares, specifically in the property sector. The situation depicted here are actually people that are saving less in order to risk their savings in higher risk / higher return investments, such as the stock market, or just consuming more at the cost of savings, which does increase GDP and subsequently property investment, but is not investment by themselves. This situation is considered not to be sustainable and is evident from an economic downturn that was experienced in South Africa in the recent past. If the trend continues, savings would be depleted and would result in a consumer spending and subsequently GDP growth to drastically reduce, due to a lack of disposable income to fund this. The clear result of this is a downturn economic activity, including direct and indirect real estate investment.

CONCLUSION

The relevance of accounting ratio's as a method of stock valuation for listed property companies was found to be inferior to other methods for determining the value of listed property shares.

The correlation of share prices and subsequently the market capitalization of the PLS shares to the financial statements of the companies revealed that the assets of the companies, being property, in itself is the investment. It is therefore stated that the PLS company is growing by finding opportunities in the market by which they are expanding. By finding these opportunities they create the boundaries of a new playfield, being the share trading market. The investors in the shares of the PLS companies stays within these boundaries, as confirmed by the high correlation between market capitalization and the balance sheet, but they are not involved or motivated directly by the returns that they receive from the companies, and rather from the share trading opportunities. This is confirmed by the high correlation of interest payments to investors with the market capitalization, but not to the share price.

The long term opportunities for the PLS companies are created by the wider economic variables. The GDP growth and various employment levels are seen as a close correlation to property market activity, which influences the opportunities that exist for PLS companies.

From this it could be concluded that listed property shares could provide good information on how investors are viewing the balance sheet, or portfolio of properties of the company itself, which could be used for interpretation of direct property market activity. This should however be used cautiously within the parameters of the irrational behaviour of investors, that causes short term fluctuations in the share prices, and which could distort interpretations. But still it provides the opportunity to get information on property market activity more timeously.

Furthermore the correlations to economic variables provide the opportunity to also predict property behaviour, based on estimates of future economic activities. This could therefore add to the interpretation of property economics.

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