'An Action Research Project Investigating the SME Credit Decision Process in a Financial Services Organisation'

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Abstract

Purpose

The aim of this study is to help a financial services organisation to make better SME credit decisions. The research is unique because it includes data from Irish SMEs, which is hoped will facilitate discussion and review within the Irish business context. While in an Irish setting, the evidence is applicable to a broader population, representing an area of further study, i.e. replicating this study across geographic boundaries.

Design / Methodology / Approach

This study used an Action Research methodology. The initial focus was on generating qualitative findings in a Community of Practice setting. This evolved into specific quantitative research with final outcomes generated through the Altman Z-Score framework.

Fifty six relevant SME businesses were identified. Balance Sheet and Profit and Loss (Income) Statement data was analysed by reference to generally used financial assessment ratios and by usage of the Altman Z-Score methodology (1968).This research builds upon Altman's work arguing that his methods are equally valid today when assessing the financial status of SME businesses.

Findings

The findings from this study indicate that:

1) There is compelling evidence that a Community of Practice was formed in this case and that this grouping has carried out work that will help the organisation to make better credit decisions.
2) There is a statistically significant difference between the financial performance of Non-Trading and Trading SME businesses and their comparative likelihood of business failure as measured by the Altman Z-Score.

Practical Implications

Key learning outcomes are described and a practical approach for lenders, business owners, accountants and suppliers of trade credit is suggested. Significant differences between the Non-Trading and Trading group performances can be used to diagnose the financial health of SME businesses.

Originality / Value

The outcomes from this study are based on Irish SME data and have practical value for various stakeholders including bankers, accountants and SME owner managers who routinely need to make SME-based credit decisions.

Practical recommendations for future study as well as current applications of the findings are proposed.

Keywords:

Z-Score, Action Research, Community of Practice, Financial Analysis, SME, Credit Decision, Failure, Lending, Business.

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Abbreviations

CDG - Credit Decision Group.

CoP - Community of Practice.

FI - Financial Institution.

SME - Small to Medium Enterprises.

Chapter 1 - Introduction

'Risk comes from not knowing what you're doing.'

(Buffett, 2014)

'Credit analysis or credit assessment is the process of assessing risk as measured by a borrower's ability to repay the loan.'

(Apostolik, Donohue & Went, 2009, p. 119).

1.1 Introduction

The purpose, or rationale, of this study is to help a financial services organisation to make better credit decisions. A review of credit risk decision methods indicates that there is no single ideal approach (Kalapodas and Thompson 2006), while the majority of SMEs actually prefer debt funding from banks rather than outside equity, as it represents a more realistic and obtainable source of funding (Bruns and Fletcher 2008) and means that control of the firm by its current owners is not diluted or weakened.

It has been found that credit decisions vary by experience of the decision makers/underwriters (Andersson 2001). Organisations have adopted various methods of credit risk assessment in accordance with their individual needs, and the strengths and weaknesses of alternative approaches. Kalapodas and Thomson (2006) suggest combining various credit risk assessment methods, including qualitative and quantitative approaches.

Soares, Pina, Ribeiro, & Catalão-Lopes, (2011) concluded that credit risk assessment divided relevant criteria into three broad areas of financial performance, market and management metrics. They noted that there was evidence that a high number of assessment factors are 'qualitative'. As a practitioner in the field of credit risk assessment, and as a participant in the action research process of this study, it can be noted this researcher's inclination is to challenge and seek quantitative-based evidence on the topic.

This study commenced as an action research initiative (Area One), examining and participating in an area generally described as credit decisioning. This involved participating in a Community of Practice (CoP), formed with the purpose of investigating the Small to Medium Enterprise's (SME) credit decision process. Qualitative findings were generated through interviews and observation notes. However, in order to address a specific issue or problem, quantitative work was also undertaken, which became Area Two.

The quantitative part of the investigation consisted of analysing financial information and testing a well-established credit assessment model (Altman 1968) against SME business financial data.

Altman's (1968) Z-Score was chosen because recent research has found that Altman's model remains effective (Sherbo and Smith 2013); the model is based on simple calculations, whose results are easy to interpret and the model utilises generally available balance sheet and Profit & Loss (Income) Statements.

This study will test the effectiveness of the Altman (1968) model using Irish SME financial data in order to generate findings that will be useful to a credit decision process and fulfil an action research project.

This study has begun this process, to illustrate how SME financial accounting data can be applied to the Altman Z-Score (1968), showing significant differences between the financial performances of businesses that discontinued and those that continue to trade. In simple terms, the Altman Z-Score claims, with much justification, to be able to predict business enterprise bankruptcy with a high degree of accuracy (Altman 1968).

Usage of such a tool merits consideration in arriving at an informed credit decision, particularly when the model utilises financial data that is generally available, or available at modest effort. This study suggests that this data is possibly underutilised by stakeholders.

SMEs are thought to make up almost all Irish business enterprises and '70% of private sector employment', (Tyrrell 2013), thus, they constitute a worthwhile research area for this reason alone. Various definitions of SME exist. For clarification, the

description, rather than the definition used in this study, is found in the GLOSSARY section.

This research is unique because it includes within it, quantitative data from Irish SMEs, which is hoped will facilitate discussion and review in a practical format within the Irish business context. In an Irish setting, the evidence is applicable to a broader audience, representing an area of further study, i.e. replicating this study across geographic boundaries.

If it is accepted that success in business is to be promoted and encouraged, and that there is sufficient financial and other data currently available to learn from failure, then the challenge becomes one of using available data to recognise and avoid failure and so support SME business ventures. In this way, a financial services organisation will be helped to make better credit decisions. This is the ultimate driving force behind this particular study.

1.2 Gaps in the Literature

This research seeks to fill a gap in the literature relating to Ireland, by analysing credit risk assessment, Community of Practice, knowledge management and action research, and by applying these themes to a specific measure of financial information on Irish SMEs. Its genesis is in action research, specifically driven by the fact that much day to day or business as usual (BAU) activity is driven by change management agendas and the continuous improvement mantra so that standing still is not an option.

In this environment, change is implemented and is almost contemporaneously assessed, reviewed and amended in an iterative process reminiscent of a practitioners, i.e. non-academic. The action research cycle is summarised below by Coghlan and Brannick (2001):

Fig 3. Spiral of Action Research Cycles (Coghlan and Brannick, 2001:19)
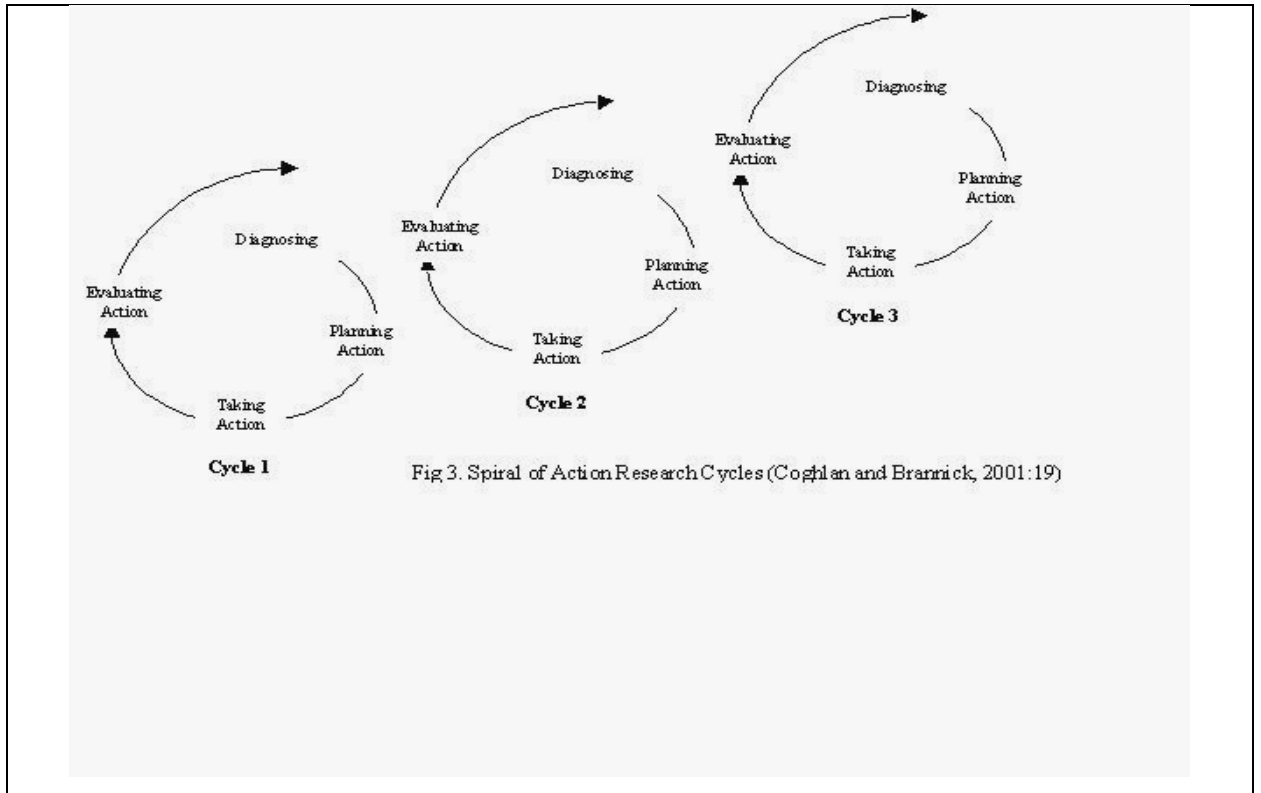
Fig 1.1 Spiral of Action Research Cycles

The research will demonstrate the visibility of CoPs in Ireland, describing one in action and illustrating a practical outcome of one, by investigation of the applicability and benefit of using the Altman Z-Score (1968) in assessing Irish SME financial data.

1.3 Main Research Questions and Hypotheses

Research is divided into two broad areas:

Area 1 – Community of Practice by way of qualitative research, through the research questions - 'Is there compelling evidence that a Community of Practice was formed in this case?'

Area 2 - Assessment of Financial Ratios and whether the Altman Z-score can be used effectively in assessment of credit decisions for Irish SME businesses.

Three Hypotheses are proposed, namely:

1. **H1** – There is a statistically significant difference between the financial performance of Non-Trading and Trading SME businesses and their comparative likelihood of business failure, as measured by the Altman Z-Score.

2. **H2** – Financial Resilience - (measured by Retained Earnings and Earnings before Interest & Tax) of a Non-Trading SME business compared to a Trading business show significant differences which could indicate a likelihood of business failure.

3. **H3** – Financial Liquidity (measured by Working Capital) of a Non-Trading SME business compared to a Trading business, show significant differences which could indicate a likelihood of business failure.

1.4 Organisation of the Study

The study is organised along the lines of the two areas of research mentioned above:

1. Area One - Community of Practice by way of qualitative research

2. Area Two – Assessment of SME financial accounting data and its application to the Altman Z-Score (1968) by way of quantitative research

It will use a sample of 56 businesses; 28 are Non-Trading, and 28 were Trading at the time of selection in April 2014. The goals of this research include adding to the body of knowledge on the subject material, to reinforce the benefits of CoP working structures and dispel to some extent a belief that their apparent absence of structure is a weakness, when in fact there is a structure and constituent parts of a CoP (Scarso, Bolisani and Salvador 2009; Iaquinto, Ison and Faggian 2011).

The way forward may well be a Community of Practice (CoP) approach, where business financial information and knowledge is shared and managed in a holistic manner so that all participants in the SME market converse in the same manner to maximum effect.

In addition, there appears to be a gap for an appropriate longitudinal study of CoPs and usage of the Altman Z-Score (1968), where SME business financial performance could be monitored and assessed over time in order to obtain insights from informed sources working in credit decision processes. This point is dealt with fully in Chapter Six, Conclusions and Recommendation.

Chapter 2 - Literature Review

2.1 Introduction

This Literature Review will put this study in context, specifically, into the context of credit risk assessments which take place within a Communities of Practice (CoP). It will also acknowledge the influence of CoP in knowledge management theory. Key focuses are on Credit Risk Assessment and Communities of Practice in an Action Research setting in that this research commenced in an action research mode. In addition, a separate assessment of the applicability of the Altman Z-Score (1968) to the financial health of a sample of Irish SME businesses will be undertaken.

2.2 Literature review

2.2.1 Area One – Community of Practice

Communities of Practice (CoP) have been identified as structures by which learning is retained, conveyed and formed (Lave and Wenger 1991; Wenger 1998).

The value of a CoP is based on its ability to help the organisation achieve the organisation's goals (Wenger and Snyder 2000; Wenger, McDermott and Snyder 2002; McDermott 2003; McDermott 2004).

CoPs existed in Grecian times and Wenger and Snyder (2000) identified four broad types of working groups, of which CoPs were distinct and different from the other three. The definition of a CoP, used for the purpose of this study, is closest to that of Wenger et al. (2002) - a cohort sharing interest in an issue, set of problems or topics (i.e. open and inclusive in subject matter scope) and expanding their proficiency and prowess in selected subject areas by regular extensive interaction between the participants, research of subject matter and evaluation by the participants, in an iterative process.

In economically and financially challenging times such as now, the value of tight control and good communication is very high (Berlinghof 2009), with substantial practitioner and academic support for the view of CoPs as the heart of knowledge management systems (Furlong & J, L. 2003).

Schenkel and Teigland (2008) opine that researchers and practitioners each advocate CoPs as 'essential building blocks of the knowledge economy'. As an aside in this technologically advancing world, in the construction of the Oresund Bridge between Denmark and Switzerland, they identified the best performing CoP units as those which had the highest informal face to face communication, a view challenged somewhat by the assertion that CoPs are now entering the virtual world, via wikis, webinars, blogs etc (Aubry, Müller & Glückler 2011).

Hara & Schwen (2006) incorporate what this researcher considers a key element in their five attributes of CoP, their fourth, 'a supportive culture (i.e. trust)', one that has a shared vision and a desire to improve personal performance by interaction with other CoP members. Roberts (2006) contributes that the knowledge creation element of CoPs may be less effective in the United States / United Kingdom-influenced neo-liberal market oriented individualistic environment, and that the boundaries of a CoP may not reflect organisational boundaries in an article which raises many challenges to the efficacy of CoPs. DeTienne & Jackson (2001) also make reference to this trust issue.

Teams play a central role in knowledge creation and team dynamics can and should generate considerable conflict and disagreement amongst participants. It should, in effect, guard against groupthink and generate better outcomes for the organisation, according to Nonaka (2000).

A study by Lee, Gon Kim & Kim (2012) highlighted that 'collaboration, learning culture, top management support, and IT support' affected knowledge process capabilities. It motioned that a successful CoP is one that enables knowledge to be developed, deployed and shared throughout an organisation (Wenger et al., 2002).

De Tienne & Jackson (2001) noted that careful knowledge management would give an organisation a competitive edge. There is a choice of definitions for CoPs, e.g. a focused one of 'The Domain, The Community and The Practice', commitment to the

domain, implying a shared competence that distinguishes members from other people, (expertise if you like), regular interaction and communal learning of practitioners in a shared practice. This process takes time and sustained interaction to develop and nurture (Wenger, 2007). Many contributors to the CoP debate highlight the importance of interaction and learning by proposing that creation, dissemination and embedding of knowledge throughout the organisation is the true source of sustainable competitive advantage (Drucker 1993).

Liedtka (1999) promoted that Communities of Practice that were united in action, in contrast to implementing 'fragmented best practices', were more effective by focusing on the underlying value system that is likely to support such communities - with an innovative organisation being able to distribute and embody the knowledge it creates (Nonaka and Takeuchi 1995). CoPs are often seen as engines of new knowledge creation (innovation) or as learning communities that build social capital (Hildreth & Kimble 2005), while others also believed CoPs could foster innovation in an organisation (Brown and Duguid 1991; Saint-Onge & Wallace 2003).

On the other hand, because CoPs are social networks, they are not easily built or created and often will show tension between formal accountability in an organization and the informal nature of CoPs (Hildreth & Kimble 2005). While not explicit, this observation raises the spectre of exclusiveness or of a clique, rather than inclusiveness in an organisation. This said, Roberts (2006) observed that members of a CoP may not be aware of its existence, reinforcing Wenger's (1998, p.125) view that 'a community of practice need not be reified as such in the discourse of its participants'. Organisations contemplating the benefits of promoting the establishment of a CoP are warned to 'avoid creating a CoP within an organisational silo', according to Iaquinto, Ison & Faggian (2011).

De Jong & Den Hartog (2007) note general agreement on the importance of leaders in triggering individual innovation but observe little integration of leadership and innovation research in the literature. Going further, they observed consistent empirical support for a positive linkage between delegation and both idea generation and application, quoting research upon German middle managers to support this view (i.e. Krause 2004). Is there a theme here to be taken forward, i.e. the suitability or

otherwise of encouraging or nurturing CoP creation as a forum for knowledge creation & innovation?

Participants in a CoP may actually be disadvantaged, vis a vis, participants form outside the organisation because purported 'expert knowledge' obtained externally is favoured (Yanow 2004). However, this researcher believes this observation applies so generally that it is best seen as a truism.

Scarso et al. (2009) helpfully provided a snapshot of the increasing number of (prestigious) global corporations who have started to develop and manage CoPs, including:

Shell	Ernst & Young	Ford
BP	Accenture	HP
Chevron Texaco	Caterpillar	Siemens
Allianz	PWC	IKEA
DaimlerChrysler	IBM	

Scarso et al. (2009) also provide a robust framework for analysing performance of CoPs, based upon four key pillars:

1) Organisational

2) Cognitive

3) Economic

4) Technological

They note difficulties in design and management of internal CoPs, with successes, but also with many failures, pointing to Coakes and Clarke's (2006) view that communities are often easier to destroy, e.g. by 'overregulation or understructuring' (2006) than construct, and that there is no ''one-best-way'' towards CoP formation and management.

In some detail, Iaquinto et al. (2011) describe the importance of understanding the coordination process and getting coordination right, whether done so by someone within or without the CoP. McDermott (2000) identified the ability to relate to people and to get people to connect as being paramount.

Action Research

Action research is facilitated or encouraged by a spirit of creativity and innovation and positively influenced by organisational behaviour, exhibiting open and transparent communication based on trust; as observed by Robbins (1996), Barret, (1997) and Martins & Terblanche, (2003).

Martins & Martins's (2002) research identified causal factors of 'organisational culture that influence creativity and innovation' as 'Strategy, Structure, Support Mechanisms, and Behaviour that encourages innovation and (open) Communication.'

They concluded that measuring (and encouraging and facilitating) a creative and innovative organisational culture held out substantial benefits, including the measurement and enablement of supports to creativity and innovation, which they noted were 'essential in being successful and adapting to changing circumstances' (Martins and Martins 2002).

Problem solving is often an iterative process where a number of attempts or solutions are required before success, which aligns with the iterative nature of Action Research. In Action Research, one has to demonstrate research rigour more particularly, 'because in action research you typically start out with a fuzzy question' (Coghlan & Brannick 2001, p.112). This 'fuzziness' continues into methodology but changes as the project develops and questions and methodology crystallise and become more

structured – as further described by Coghlan & Brannick, 2001. This is what transpired in this research.

The research focus point was identified as a specific project or piece of work taking place within an Irish Financial Institution (FI), in which this researcher was to participate. This meant that a key element of action research would be satisfied in that the researcher would be acting as an accountable participant in the solving of a real-life issue or problem, rather than merely acting as an external researcher or observer (Checkland, 2010).

2.2.2 Area Two – Assessment of Financial Ratios and whether the Altman Z-score can be used effectively in assessment of credit decisions for Irish SME businesses.

> 'SMEs are a fundamental part of the Irish economy and account for 99.8% of all enterprises and 70% of private sector employment in Ireland.'
>
> (Tyrrell, 2013)

It is for this reason, amongst others, that Irish financial institutions value and concentrate upon SME business activity and strive to understand and support SME businesses, particularly in their financing needs.

The issues affecting SME start up and development are not easily itemised or addressed. Even a close association with academics, because of a certain image of academics, may be detrimental to the standing of a firm within the business community (McAdam and Marlow 2008).

In relation to access to capital, the resource based view of the firm (RBV), Penrose (1959, p.17) has put it plainly, stating, 'the small firm is itself a greater risk'. For a number of reasons, but again, put plainly by Penrose, business failure 'may involve the loss of the money advanced' (2009, p.192). This argument is made on the fact that small firms (often new or young ones) simply haven't reached scale.

2.2.2.1 Business Failure

What is business failure? There are many definitions. Cressy (2006) opined it as when a business' 'value' is less than the 'opportunity cost' of continuing with the business venture. Some argue that fraud in business is underreported and under the radar but a major cause of business failure and that often, by their nature, SMEs have few resources while having material debt obligations meaning business failures occur quickly (Carland, Carland and Carland 2001), this notwithstanding diligent analysis of financial information available.

Others opine that inability to develop expert competence is an apparent deterrent to SME development growth and maturity which ultimately leads to 'outright failure' (Darcy, Hill, McCabe and McGovern 2014).

Judicious analysis of business failures, rather than focusing exclusively on business successes, may well generate greater insights for application to entrepreneurship and business activity generally (McGrath 1999).

Business failure is not just an Irish phenomenon. Research internationally demonstrates that overall, over 66% of SMEs close within ten years of commencement (Zontanos and Anderson 2004). Specific Canadian research has extrapolated that 75% of SMEs are no longer operating nine years after being set up; only 25% survive the first nine years (Hunter 2011).

If in general the 'upside potential rewards' are finite and the downside potential costs are infinite, entrepreneurial activity will be constrained (McGrath 1999). Recent findings in Ireland show a conflict between political rhetoric supporting entrepreneurial risk taking and steps taken against those who fail (McCarthy, O'Riordan and Griffin 2014).

Another recent study, centred in a multinational's 'idea and innovation' programme, found that 'failures rather than successes' drove additional initiative-taking (Deichmann and van den Ende 2014). More recently again, in July 2014, Bill Gates of Microsoft published on his website that his favourite business book is, 'Business Adventures' by John Brooks, which documented difficult lessons and failures

suffered by top business corporations; this book was recommended to him by Warren Buffet of Berkshire Hathaway (Gates 2014).

2.2.2.2 Information Asymmetry

In considering the newness or youth of a business; while this research will not assess information asymmetry as between SME business, their advisers and financial institutions in detail, it acknowledges that some research has identified variability in lending assessment, variability in the approaches of different lenders and a bias towards financial information and challenging whether the right criteria are being used to assess SME ventures by financial institutions (Deakins and Hussain 1994). Often in SMEs, an asymmetric information situation arises which may mean that bank lenders have insufficient company-specific information and find it difficult to evaluate SME abilities, strengths and weaknesses (Sinkey 1992). Informative research undertaken in Swedish banks, which are built on asymmetric information and risk taking, identified that the three most important factors in a lenders decision to lend were:

A)   Past performance

B)   Financial standing

C)   Competence within the business project.

This research further noted that the results suggested that Banks considered that past performance was a relatively good predictor of future performance and that this signalled conservatism (Bruns and Fletcher 2008). In addition, as a practitioner in credit risk decisioning, this researcher acknowledges that the new venture proposal attracts particular challenges for credit risk assessment.

Altman (1968) proposed that traditional ratio analysis in assessing the financial health of a business, particularly its likelihood of falling into bankruptcy, was hindered by the univariate nature of the analysis (in general), and an emphasis on individual business issues or problems. He advocated an approach which highlighted the strengths of ratio analysis, rather than disparaging ratio analysis, changing the focus to identification of the most important ratios, ascribing appropriate weights of

importance (to bankruptcy prediction) of particular ratios – through objective research. He defined bankruptcy 'in its most general sense, meaning simply business failure.' (1968, p.591).

Much research has continued into the Z-Score and Altman proposed a number of variants of the 1968 Z-Score model over the years, however, the original 1968 version remains the version most consistently relied upon by practitioners today (Gutzeit and Yozzo 2011). Altman (2009) has said that the more risk models the merrier, when he himself was working on an updated model, to take account of 'non-accounting factors' (Fitzgerald, 2009). More recent research again has concluded that the efficacy of the 1968 Altman Z-Score, 'to evaluate the future financial health of a corporation and the prediction of bankruptcy', has remained undiminished (Sherbo and Smith 2013). 2012 saw another new and improved Z-score (the Z-score+), released with the launch of an accompanying Smartphone Application (Managing Credit, Receivables and Collections 2012).

Altman (1968) in his proposal of the Z-score (of bankruptcy prediction) used elements of financial information from business financial statements, incorporating them in a discriminant function which generated the Z-score, i.e.

$$Z = .012X_1 + .014X_2 + .033X_3 + .006X_4 + .999X_5$$

where X_1 = Working Capital / Total Assets

X_2 = Retained Earnings / Total Assets

X_3 = Earnings before Interest & Taxes / Total Assets

X_4 = Market Value of Equity / Book value of Total Debt

X_5 = Sales / Total Assets

Z = Overall Index

2.2.2.3 Other Insights

A Lithuanian study which created a Credit Rating System (Boguslauskas, Mileris & Adlyté 2011), where model performance review confirmed a positive validation, used seven key financial ratios:

1) Net profit margin
2) Earnings before interest and taxes to total assets
3) Net profit to total assets
4) Earnings before interest and taxes to sales
5) Current ratio
6) Quick ratio
7) Debt ratio

Given the variety of approaches and absence of uniformity in this approach to model design, the absence of a standardised method for assessment of credit risk is an important performance issue - with analysis indicating no ideal method for credit risk assessment and that the various methods adopted have particular 'strengths and weaknesses' according to Kalapodas & Thomson (2006). Kalapodas & Thomson's 2006 study identified strengths and weaknesses, then reviewed and assimilated views and recommendations from the academic literature and specific interviewees, and made definitive suggestions which can be summarised as combining various credit risk assessment methods (Kalapodas & Thomson 2006).

More recent studies have found little if any correlation between bank lending to the private sector and economic growth for financial crises preceded by credit booms, which is the case currently in most countries. This would then seem to challenge a prevalent view that deleveraging in advanced economies is to be feared (BIS 2013).

Much has been written about credit risk assessment and different approaches, quantitative-led and qualitative-driven. Soares et al, (2011) concluded in its Portuguese study, that credit risk assessment divided relevant criteria into three broad areas of Financial performance, Market, and Management, with evidence that a high number of assessment factors are 'qualitative'.

Usage of the most common statistical analysis was limited by the relevance of qualitative/judgemental facets, leading these authors to recommend a Multiple Criteria Decision Analysis Approach. In other words, in credit risk assessment, the arguments for quantitative vs. qualitative assessment (plus quantitative with qualitative assessment) and historic vs. future performance measures and tangible vs. intangible or creative attributes, have always existed.

A bias against intangible assets, including human capital and intellectual property, has often been claimed (Guimon 2005) and various measures including Intellectual Capital (IC) reporting have and continue to be promoted so that qualitative attributes, summarised as IC value, can be appropriately considered, weighed and assimilated into credit risk assessments. One might say this is another expression of the Equity vs. Debt capital argument, where Equity funding links to qualitative (very simply expressed as hoped for performance), while Debt contributions need to be based on quantitative performance measures (the necessity of lenders to get their money back as their return is very low for their risk).

Bank for International Settlements

The Bank for International Settlements (BIS) in its Principles for the Management of Credit Risk document ascribes the principal cause of serious banking problems to lax credit standards, poor portfolio risk management, or inattention to material economic or business changes, which 'can lead to a deterioration in the credit standing of a bank's counterparties' (BIS 2000).

This BIS document is a rich source of fact, opinion and guidance, with its appendix, 'Common Sources of Major Credit Problems', providing relevant content for researchers and practitioners in the subject of credit risk assessment and management (BIS 2000).

In accepting BIS diagnosis of the principal cause of serious banking problems, assessment of 'counterparty default risk' is the most important purpose of credit risk models according to Fatemi and Foladi (2006) in a sample of US banks according to the 21 responders. Furthermore, risk inherent in a particular credit portfolio is heavily

underestimated if correlations between obligors (debtors) are ignored (Münnix, Schäfer & Guhr 2014).

Multi Discriminant Analysis

More recent work using Multi Discriminant Analysis (MDA) promised to enhance a bank's ability to make correct customer classification and thereby improve the predictions for a firm's performance and credit risk assessment (Chijoriga 2011), thereby adding to the debate in relation to efficacy of credit models.

Hayes, Hodge & Hughes (2010), drawing on Altman's Z-score model (Altman 1968), note that success in predicting future financial distress is generally regarded as exceeding

- 90% success rate in the year before bankruptcy and

- 72% to 80% in the year or two before bankruptcy bases its assessments very largely on the five common business ratios, described above, systematically weighted in various calculations.

Score and predictive accuracy is impacted by the actual industry or sector being surveyed and other industry-relevant factors (Hayes et al, 2010). As previously stated, output of the assessment is reflected in a Z-score. A high numeric score indicates a financially strong status, while low scores point to financial weakness (Ferrier et al 2002, cited in Hayes et. al. 2010). It should be noted that macroeconomic factors heavily influence effective credit risk decisioning, e.g. business cycle scenarios described as boom, contraction, average and mixed period used to categorise studies (Gavalas & Syriopoulos 2014). Risk grade migration (Ruffin 2014) and Credit ratings migration (Gavalas & Syriopoulos 2014) are regularly mentioned as key additional assessments and projections of trends and movements in the risk profiles of businesses making up the bank's loan book population.

In this way, effective credit risk assessment at the transaction level feeds into aggregated information capable of MDA assessment by senior management within financial institutions.

Does the foregoing mean that we have the financial information and tools to tackle the lax credit standards for borrowers and counterparties, and poor portfolio risk management elements of the BIS assessment at the head of this review? Altman

(1968), acknowledging the work of Beaver (1967) and Deakin (1972), noted the importance and relevance of traditional ratio assessment but stressed that they were inefficient when analysed in isolation and that a multivariate approach was required with analysis then capable of being greatly simplified to one dimension such as bankrupt or non-bankrupt.

This research challenges Kosmidos and Stavropolus' (2014) findings that most 'proposed corporate failure diagnosis models in the literature exhibit an endogenous drawback since their construction is based on large entities or listed corporations' samples'. Whether or not this is the case generally, the Altman Z-score in particular is not negatively impacted by the form of its construction.

This study adopts a similar approach in investigating the financial performances of 28 Irish SME 'not-trading businesses' and 28 'trading businesses', seeking to assess how and if their financial metrics reinforces what Altman was saying and continues to say abiout risk.

Synthesis and Conclusion

This researcher has noted the various opinion and studies referenced here and concludes that much of the research and study is formulated upon the interrelationship and social elements of the subjects studied. There was an obvious gap in this knowledge and the researcher wished that more research was conducted within business environments, with due regard for Intellectual Capital and the relevant competitive factors which represent competitive advantage. In relation to the quantitative studies, much of the information is in relation to businesses and firms which are so large (Altman 1968), that comparisons with the greater number of smaller businesses is difficult.

On foot of this synthesis, this researcher rationalises that a particular End to End Process or Methodology merits research. In this study, a line is drawn between the setting up of a specific group (the CoP research subject matter) and a business need, i.e. improved credit decisions.

In this way, it is hoped the various research and studies done to date will be placed in a context of a piece of work taking place in a financial services organisation/financial institution, which amongst its key goals is to make better credit decisions.

Chapter 3 - Research Methodology

Thesis Subject –

'An Action Research Project Investigating the SME Credit Decision Process in a Financial Services Organisation'

3.1 Introduction

This study used an Action Research methodology. The initial focus was on generating qualitative findings in a Community of Practice setting. This evolved into specific quantitative research with final outcomes generated through the Altman Z-Score framework.

3.2 Research Objectives

The key objective in this area is to follow and facilitate a programme of action within a CoP in a financial organisation. By adopting an action research approach encapsulated in the research question, a qualitative research process was commenced. The Research Question is – 'Is there compelling evidence that a Community of Practice was formed in this case?'

Within this action research journey, an opportunity arose to investigate the SME Credit Decision Process, which itself was being reviewed by the particular financial organization involved in this investigation. This quantitative investigation became Area Two, an Assessment of Financial Ratios and whether the Altman Z-Score can be used effectively in assessment of credit decisions for Irish SME businesses

It appeared most effective to express this particular research by way of Hypotheses, namely

1) **H1** – There is a statistically significant difference between the financial performance of Non-Trading and Trading SME businesses and their comparative likelihood of business failure as measured by the Altman Z-Score.

2) **H2** – Financial Resilience - (measured by Retained Earnings and Earnings before Interest & Tax) of a Non-Trading SME business compared to a Trading business show significant differences which could indicate a likelihood of business failure.

3) **H3** – Financial Liquidity (measured by Working Capital) of a Non-Trading SME business compared to a Trading business, show significant differences which could indicate a likelihood of business failure.

3.3 Research Sample

There were two distinct groups or samples in this study. For Area One, the group comprised co-participants, with this researcher in the Credit Decision Group, being assessed for the existence of a Community of Practice. The group was composed of senior managers who generated or introduced SME sector business, particularly credit/lending transactions or managed teams which originated credit transactions (amongst other business and management activities) or who supported business activities aimed at originating and managing credit transactions of business customers (e.g. business sector specialists or operational specialists). Senior Credit Risk decision makers or those in similar risk positions were later included.

The summary profile of CDG / CoP participants is of a group of people who are senior bankers, men and women with fifteen to thirty+ years practical banking experience, specialising in credit-based transactions. Each participant is an employee of the same financial organisation.

For Area Two, the group comprises 56 SME businesses. They have been identified by their trading status and thereafter by an assessment of their financial performance, based upon analysis of Balance Sheet and Profit & Loss (Income) Statements information. This group divided evenly into 28 Non-Trading businesses and 28 Trading businesses.

The information within this research is derived from

- The Literature
- Observations of the researcher while participating in the CoP known as the Credit Decision Group (CDG)
- Assessment of financial information based upon analysis of Balance Sheet and Profit & Loss (Income) Statements of the 56 SME businesses.

Area One data was collected by way of Participation and Observation in the action research and Community of Practice elements of the study, identified as Area One. The period of participation within the CoP commenced on 13 March 2014, with the first formal meeting attended on 27 March 2014. The CDG group continues to do its work and the researcher's participation is continuing.

Area Two information, i.e. the specific financial information of 56 SME businesses was collected from assessments of Balance Sheet and Profit & Loss (Income) Statements for each individual business. This information is separately listed in its entirety within this research at Appendix 1. The bulk of the financial information is available from the Companies Registration Office (CRO) or private credit rating information provider, usually for a fee.

There is an interrelationship between Areas One and Two in the assessment of whether an effective CoP was established in the particular financial organisation, that knowledge management was being fostered, and that through action research, the quantitative element of this research was generated. It is through this subsequent quantitative research, a gap in the literature relating to the study of Non-Trading and Trading Irish SMEs financial performance was identified.

Its structure is as follows:

1. Review and summarise existing literature in relation to Communities of Practice, with reference to knowledge management and action research
2. Describe particular research in relation to CoP and financial information assessment
3. Review and summarise existing literature in relation to credit risk assessment

4. Specifically assess the financial information held in relation to the 56 SME businesses and conduct an Altman Z-Score analysis of these Non-Trading and Trading groups.

5. Present Findings

6. Discuss the Results and convey Conclusions & Recommendation based on the research outcomes.

Participant Selection

The members of the CDG group within the FI were previously identified in order that key divisions of the FI were represented in the piece of work which was being undertaken. This researcher had no part in establishing this group and did not seek to influence the constitution of its membership in any way.

The group of 56 SME businesses is divided further into 28 Non-Trading and 28 Trading businesses and these were selected by reference to Company Registration Office information for businesses Non-Trading, while an equivalent size sample for Trading business was drawn up using a benchmark of mean Total Revenues (Sales) as a proxy for equivalence.

3.4 Research Instrument (Method)

3.4.1 Area One

For Area one, the research method will be qualitative research within a Community of Practice in action.

In Lewin's (1946) theme that no learning can take place in a field which lacks objective standards of achievement, he reinforced his concept of action-research, which he then identified as comparative research on the conditions and effects of various forms of social action, and research leading to social action, expanding to say that research that produces nothing but books was insufficient.

Love et al (2012) used action research to develop a procurement selection process to enable clients and stakeholders to match their needs and objectives for better value for money outcomes. Action research presupposes that the research team observes, records, and improves situations (Reason & Bradbury 2001). The action researcher needs to clearly demonstrate the procedures used in the research and stand over them (Coghlan & Brannick 2001). The spirals of the action research cycles, illustrated below, describe the iterative nature of the action research process, a process which redefines the research question until it is well honed (Gummesson 2000).
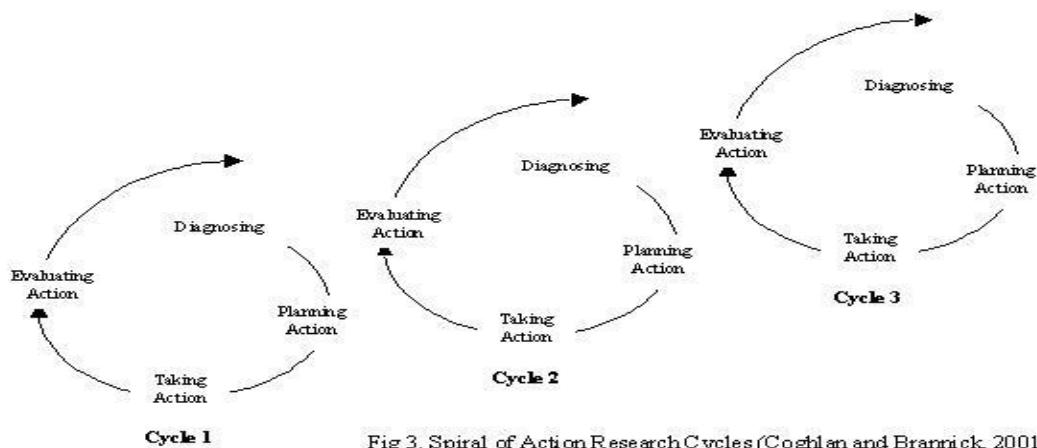
Fig 3. Spiral of Action Research Cycles (Coghlan and Brannick, 2001:19)

Fig 3.1. Spiral of Action Research Cycles. Source . Coghlan, D. and Brannick, T. (2001)

More recently, Gummesson (2008) restated the argument for greater utilisation of 'observation, researcher involvement and direct experience'. While speaking particularly of marketing activities, the lessons apply also to this particular study.

The methodology has chosen itself because the goals here are 'clearly defined and significant' (Coghlan & Brannick 2001), namely to follow and facilitate a programme of action within a financial organisation in Ireland. This action of the FI is itself designed to review existing credit decision practices and enable and nurture

collaborative and effective business engagement between employees who are the public face of the business bank with those in the Credit Risk (loan underwriting) part of the bank who are principally responsible for credit risk assessment and management.

This relationship is an important check and balance relationship, which if not well-managed may result in too little business being taken on or too much or poor credit risk quality business being taken onto the FIs books, either eventuality (i.e. too much or too little new and increased lending activity), or by having a material business and financial impact on the Bank's own fortunes (Ammann 2001).

The Methodology utilised for observation and reporting upon the CoP was guided very largely by Coghlan and Brannick's, 'Doing Research Action in Your Own Organisation' (2001), approach and guidance, specifically in relation to Diagnosing; Planning Action; Taking Action; and Evaluating Action, in an iterative process as diagrammed above.

Such action is somewhat planned in the Credit Decision Group's own plan. In this way the broad agenda and direction of 'travel' is mapped out while the detail, actors, implementation, monitoring, performance and revision are not finalised and can change as the project continues. This is where Action Research comes in, and in particular, Reflection. Reflection will be structured in three elements namely, Content, Process and Premise (Mezirow 1991).

3.4.2 Area Two

For Area two, there will be quantitative research by way of assessment of the financial performance of 56 SME businesses, using primarily eight financial measures, with one discriminator of Non-Trading or Trading. This replicates the Multi Discriminant Analysis (MDA) approach adopted by Altman (1968). It is not argued in 1968 or since then or now that there are differences between Non-Trading or Bankrupt businesses and Trading or healthy ones. These differences plainly exist. The primary advantage of MDA (and the reason Altman used it and why it is

replicated here) is the 'potential of analysing the entire variable profile' (1968) at the one time, rather than individually inspecting each attribute one after the other.

Others who have replicated the quantitative work of Altman (1968, 2000), include Hayes et al (2010), Figini & Giudici (2011), Jin-Chuan & Shrestha (2011) and Sherbo and Smith (2013).

The entire credit risk decision exercise acknowledges that there is a qualitative and also a quantitative element to assessment (Kalapodas and Thomson 2006; Soares et al 2011). They contrast the benefits of qualitative research when compared with quantitative research and renew suggestions that there is a place for each, with perhaps quantitative research being most effective when one needs to identify the 'devil in the detail'. The criticality of properly assessing the 'credit risk' of a borrower is reinforced because of the information asymmetry prevalent for SME businesses (Bruns and Fletcher 2008).

The approach mirrors that of Altman in his 1968 research, 'Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy', except for some changes which are outlined below:

1. Whereas Altman was able to use Market Value of Equity (MVE), as the businesses he used were quoted on the Stock Exchange, this study has used Book Value (BV) of the enterprises, obtained from the financial accounts (see Glossary for definition of BV)

2. 56 businesses are used rather than 66; this was considered a modest change and not statistically significant when the size of Ireland is compared with that of the USA. As a further contrast, while also using large publicly quoted companies, Hayes et al, 2010 used 18 companies.

3. The Altman Z-Score (1968) was used to analyse firms with Total Asset (TA) values in the range $1,000k to $100,000k, say €750k to €75,000k for comparison purposes. In contrast, this particular study has incorporated assessment of SME businesses, those which predominantly have a TA of < €750k. In fact 30 or 54% of the 56 businesses had TA < €750k. 19 of this number belonged to the Non-Trading group and 11 to the Trading group.

3.5 Limitations:

The study may be limited in two ways:

1. Possibly by some researcher participant bias in relation to CoP observation, though this has been robustly managed for, by way of structured observation and Reflection.
2. Differences in recording of similar events in different financial information, i.e. financial information is capable of being presented based on different interpretations. In mitigation, this occurs within the financial data of the smallest to the largest enterprises, so it is not unique here.

3.6 Philosophy

The research philosophy grounding this research is influenced by Carr (2006, p.434) who strongly opines that:

> only by seeking to ensure that the void created by the demise of practical philosophy will not be filled by a research methodology that action research will be able to defend the integrity of praxis against all those cultural tendencies that now undermine and degrade it.

In the same paper, Carr (2006, p.426) illustrates praxis as a 'form of 'doing' action, precisely because its 'end'- to promote the good life - only exists, and can only be realised, in and through praxis itself. In this same way, action research arises through doing and this particular research has its genesis in the doing of the work or usual activity of a financial organisation.

3.7 Ethical Considerations:

There were ethical considerations relevant to this research because bankers from one particular FI were being observed in their daily work. Thus, financial information from SME businesses has been used as the basis of the research. In each case, the names and identifying details of participants and of businesses whose financial information, however sourced, was assessed have been anonymised so as not to be individually identifiable.

3.8 Data Analysis

Area One Research, in relation to the Community of Practice, was carried out through participation and observation. The settings in all cases were in conference rooms in formal setting, in other less formal office settings, or in other places of business. Atmospheres ranged from formal, with a chairperson, to less formal working groups and individual pieces of work.

Area Two Research, in relation to the assessment of financial information, was based upon financial information sourced from the Balance Sheets and Profit & Loss (Income) Statements of 28 Non-Trading businesses and 28 Trading businesses.

The specific information which forms the basis of the quantitative elements of this research is represented in two tables, split into 28 Non-Trading and 28 Trading businesses; both are available at Appendix1

This research incorporates specific hypotheses from an examination of the comparative financial performance of these 56 Irish SME businesses.

The financial research reports on the financial analysis of two cohorts of Irish SME businesses, which are divided into 28 Non-Trading businesses and 28 Trading businesses. Key learning outcomes are described and a practical approach for lenders, business owners and suppliers of trade credit particularly is suggested for the future.

CHAPTER FOUR – Findings

4.1 Introduction

Findings are divided into the two Areas of investigation. As they can be viewed and examined separately, this is how the findings will be presented.

4.2 Area One - Community of Practice (CoP)

Again, the research question is - Is there compelling evidence that a Community of Practice was formed in this case?

4.2.1 Business Banking Credit Decision Group

This group was formed in September 2013 and named the 'Business Banking Credit Decision Group' (CDG).

4.2.2 Assessment of the CDG against key characteristics of a CoP

Characteristics and performance of the CDG were compared with the key characteristics of a CoP over time, namely as follows:

Key characteristics of a Community of Practice -	Were these characteristics evident in the CoP being observed?
Sustained mutual relationships – harmonious or conflictual	Yes - harmonious
Shared ways of engaging in doing things together	Yes
The rapid flow of information and propagation of innovation	Some evidence – note the CDG's primary goal is to 'to consistently operate to the highest standards of credit stewardship'' and 'facilitate the right environment for this to occur'
Absence of introductory preambles, as if conversations and interactions were merely the continuation of an ongoing process	Yes – for the most part
Very quick setup of a problem to be discussed	Yes – regular occurrence
Substantial overlap in participants' descriptions of who belongs	Yes
Knowing what others know, what they can do, and how they can contribute to an enterprise	Yes- some evidence
Mutually defining identities	Yes
The ability to assess the appropriateness of actions and products	Yes
Specific tools, representations, and other artefacts	Yes – with an appreciation of where gaps existed – where gaps were to be filled in or mitigated
Local lore, shared stories, inside jokes, knowing laughter	Limited evidence and no material evidence of 'inside jokes, knowing laughter'. This researcher observed this as a strength noting Iaquinto et al's (2011) admonition that organisations contemplating the benefits of promoting the establishment of a CoP are warned to 'avoid creating a CoP within an organisational silo'
Jargon and shortcuts to communication as well as the ease of producing new ones	Yes – growing evidence as the CoP became further established

Certain styles recognized as displaying membership	No evidence apparent
A shared discourse reflecting a certain perspective on the world	Yes – growing evidence as the CoP was becoming further established.

Table 4.1 - Source: Compiled from Wenger (1998, pp. 125–6). Completed by the researcher from observation

In looking at the CDG as a Community of Practice, three uniting key elements to a CoP require consideration, namely, Domain, Community and Practice, which are apparent in this CoP and best summarised in this table above.

4.3 'Assessment of the CDG against the key elements necessary to develop in a CoP

Element	Element Summary	Were these elements evident in the CoP being observed?
Domain	The definition of the area of shared enquiry and of the key issues	Yes - 'all operational and qualitative aspects of credit risk management'. The importance and relevance of the Domain was visibly expressed and strongly communicated by way of Critical Factors objectives and The Five key themes of the CDG Strategy & Action Plan
Community	The relationships among members and the sense of belonging	Yes - FI staff that originated or managed teams which originated credit transactions or who supported business activities aimed at originating and managing credit transactions of business customers. Credit underwriters or those in similar second line risk positions.
Practice	The body of knowledge. methods, stories, cases, tools, documents	Yes - Comprehensive and extensive body of business and banking knowledge supported by formal management information (MI) sources.

Table 4.2 based upon ''Cultivating communities of practice – a quick start-up guide (Etienne Wenger 1998).

4.4 The CDG's own critical factors objectives

Critical Factors objectives	Summary of the objective
Primary Objective	'to consistently operate to the highest standards of credit stewardship'' and 'facilitate the right environment for this to occur'
Secondary Objective	'helping to shape and influence the interface with the Credit Risk team'

Table 4.3. Source 'Business Banking Credit Decision Group Scope' document.

See Appendix 2.

4.5 The CDG's own key 'themes' of action

From these Objectives fell a number of key 'themes' of action, i.e. The Five key themes of the CDG Strategy & Action Plan:

Theme Description	Summary
1. Controls / Data Integrity	Robust and standardised control & effective data integrity.
2. Appetite	Embedding of existing Credit appetite statements, processing relevant sector market information & developing a framework for advancing new business loan requests.
3. Process	Maximising efficiencies of the credit decision process & standardising various ad hoc processes in advancing increases and new business lending funding requests.
4. Development	Develop Relationship Managers skills on a structured basis (technical, business, and relationship management skills) to maximise abilities and potential within the RM staff cohort.
5. Engagement	Communication; to minimise noise and enhance effective collaboration amongst the CDG, RMs, especially the Credit Risk team (plus other key stakeholders substantially in the FI's oversight and audit functions).

Table 4.4. Source 'Business Banking Credit Decision Group Scope' document

4.6 Critical success factors of a CoP in an organisation

Wenger (1998) enumerated some critical success factors of Communities of Practice in an organisation. When his characteristics are used as comparators for the operations of the Credit Decision group the following assessment is evident:

Critical success factors of Communities of Practice	Were these characteristics evident in the CoP being observed?
Strategic relevance of domain	Yes - the strategic relevance of the domain as published – 'all operational and qualitative aspects of credit risk management' – is not to be doubted as a bank fails or otherwise on the quality of its loans (Ammann 2001). The strategic relevance of the domain was strongly communicated by way of Critical Factors objectives and The Five key themes of the CDG Strategy & Action Plan, as discussed above.
Visible management sponsorship, but without micro-management	Yes - Visible management sponsorship was consistently evident including when this researcher observed the CDG formal leader and chair commence the meeting of 27.3.14 with a short opening address wherein he restated the CDG goal as to 'spread the credit gospel' and win the 'hearts and minds' of those colleagues engaged in credit-based transactions.
Dance of formal and informal structures	Yes – very evident. The FI has formal well-developed structures, processes and procedure s to manage its business and also to facilitate evidence of activities to Regulators. In addition to this, informal working groups were formed and completed work and reported back to the group. Subject matter experts were invited in for their experience and knowledge, for varying issues and timeframes. One particular action which was generated by the group is Area B of this study.
Adequate resources	Yes – for most issues and tasks. This researcher challenges the validity of this particular factor for a CoP on the basis that it is not unique to CoPs. Resources are an issue for almost all activities wherever undertaken and in many ways a subjective matter, though not always. In addition, resources

	may be obtained by way of loan, sharing or other avenue and a resourceful person or group may be able to fill an apparent gap in another way.
Consistent attitude	Yes – strongly evident and regularly reinforced by the group leader who used many opportunities to align attitude to the Domain and objectives of the Credit Decision Group.

Table 4.5. Compiled from Wenger 1998

4.7 Observations made upon Reflection of the Action Research -

Observation	Summary
Large Firm Syndrome (to coin a phrase)	It is appropriate to acknowledge that CoPs operate within an environment and the CDG was evolving in a large organisation or firm such that Penrose's (1959) observation that differences in the 'administrative functions' of very small and very large firms are so extreme as to render the functions incomparable between them. Thus, in this researcher's opinion, the firm size is an additional challenge to the effective operation of a CoP, although not an impediment to the establishment or activities of a CoP.
Coordination and People Management.	It was noted that coordination of participant's contributions and recording of contributions and decisions made was of a very high order, a very important element for CoP effectiveness (Iaquinto et al., 2011). In addition, there was evidence of good personal relations and effective connections between people within the group (McDermott, 2000).

Table 4.6. Observations made upon Reflection of the Action Research

4.8 Research Question Finding

Based on participation in and observation of the Credit Decision Group, together with information, opinion and observation of Key Informants, as illustrated and summarised in this Findings report, there is compelling evidence that a CoP was formed in this case.

In summary, the CDG is formally structured in such a way that the Key characteristics and elements of a Community of Practice were observable and evident, namely Domain, Community and Practice, and are assessed and commented upon.

The five critical success factors of Communities of Practice were observed to be present and are also commented upon, together with two particular observations, one which is a challenge to the effective operation of a CoP, and the other was observed to be strength of the particular CoP and mitigant for the challenge of Firm Size Syndrome.

Area Two – Assessment of Financial Ratios and whether the Altman Z-Score can be used effectively in assessment of credit decisions for Irish SME businesses.

4.9 Restatement of the Hypotheses

H1 – There is a statistically significant difference between the financial performance of Non-Trading and Trading SME businesses and their comparative likelihood of business failure as measured by the Altman Z-Score.

H2 – Financial Resilience - (measured by Retained Earnings and Earnings before Interest & Tax) of a Non-Trading SME business compared to a Trading business show significant differences which could indicate a likelihood of business failure.

H3 – Financial Liquidity (measured by Working Capital) of a Non-Trading SME business compared to a Trading business, show significant differences which could indicate a likelihood of business failure.

4.10 Descriptive Statistics

€k Non-Trading	BV (of Net Assets or Equity)	Total Assets	Total Liabilities	Retained Earnings	EBIT	C Assets	C Liab.	W. Cap CA - CL
n	28	28	28	28	28	28	28	28
Min	-1,921.0	3.0	26.0	-1,922.0	-783.0	1.0	26.0	-1,346.0
Max	5,348.0	8,426.0	5,666.0	1,076.0	313.0	1,623.0	2,276.0	649.0
Mean	222.1	1,277.0	1,083.4	-102.0	-63.5	474.7	607.3	-132.5
Median	-10.5	550.0	648.5	-29.5	-11.5	304.5	403.5	-43.0
Std Dev	1,145.5	1,919.3	1,241.8	556.2	265.5	461.7	603.6	421.1

Table 4.7a Descriptive Statistics

€k Trading	BV (of Net Assets or Equity)	Total Assets	Total Liabilities	Retained Earnings	EBIT	C Assets	C Liab.	W. Cap CA - CL
n	28	28	28	28	28	28	28	28
Min	47.0	253.0	97.0	-257.0	-50.0	238.0	97.0	-249.0
Max	2,177.0	2,348.0	1,090.0	2,177.0	528.0	2,192.0	982.0	2,021.0
Mean	516.9	988.9	472.0	476.6	99.4	762.5	360.5	401.9
Median	386.0	911.0	431.5	337.0	45.5	582.0	294.0	153.5
Std Dev	551.5	551.2	275.8	576.9	136.6	529.6	231.8	569.9

Table 4.7b Descriptive Statistics

Tables 4.7a and 4.7b provide a summary of the basic descriptive statistics from the Non-Trading and Trading groups. Each table presents this information for the variables, which are the elements of Altman's Z-Score. This facilitates individual analysis and brief discussion of each variable.

Book Values (BV) refer to the amounts of Equity, as estimated in each company's books of accounts and presented in the company's balance sheet. This figure can and has been verified by applying the Accounting Equation: TA-TL=E where TA = Total assets, TL = Total Liabilities and E = Equity.

There are wide variations in figures for the two groups. For instance, the median of the Non-Trading group of companies (group 4.7a) is NEGATIVE -€10.5k compared to a much higher (positive) figure of €386.0k for the Trading companies (group 4.7b)

4.11 Basic Descriptive of the Histograms

<u>Book Value</u>

BV   Non-Trading
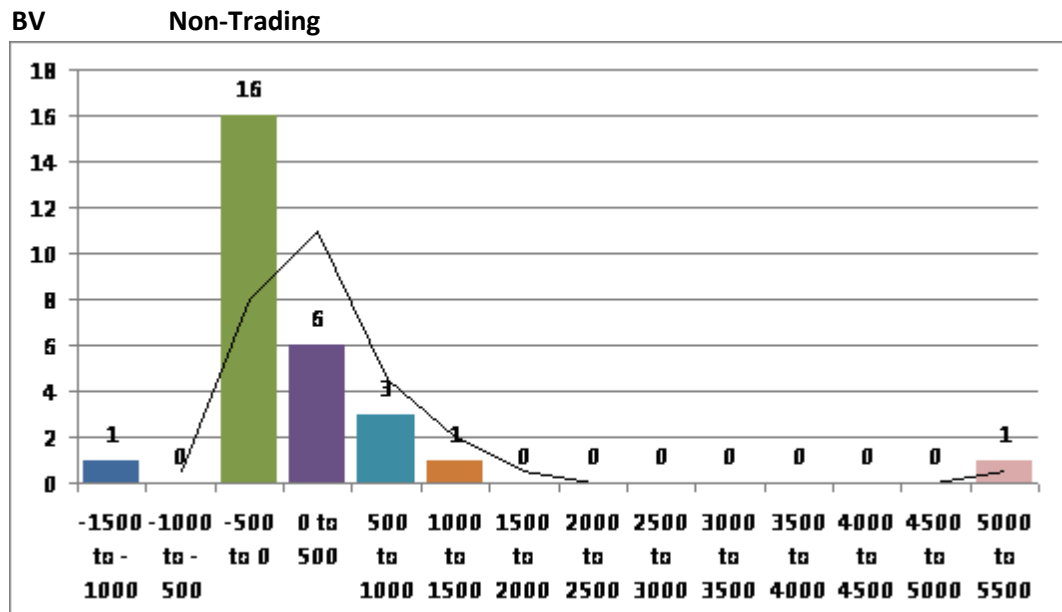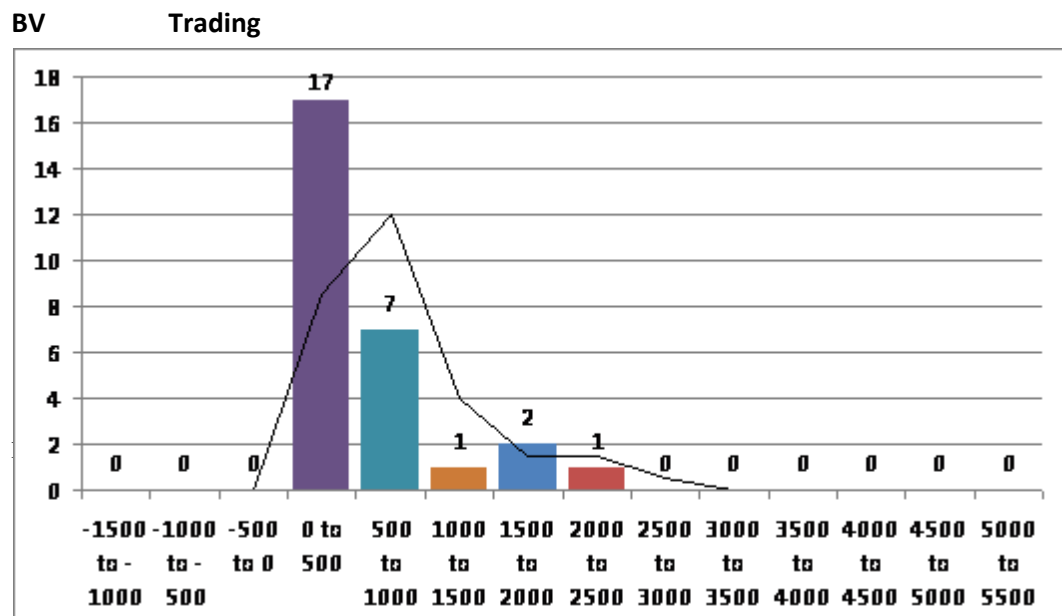
Fig 4.1a

BV   Trading

Fig 4.1b

The tables measure Frequency of occurrence on the X axis, and monetary values along the Y axis so that the greatest number of constituent companies in the Non-

Trading group is 16; they have a Book Value range of NEGATIVE-€500k to €0k, followed by 6 companies with a Book Value range of €0k to €500k. The Trading group has 17 businesses in the range of €0k to €500k, with 24 / 86% out of its 28 sample companies in the BV range of €0k to €1,000k.

The means are not of comparable size and the Non-Trading mean is just 43% of the Trading mean, at €222k for Non-Trading, and €517k for Trading businesses.

Medians are NEGATIVE-€10.5k for Non-Trading compared with €386k for the Trading companies, illustrating that more than 50% of the Non-Trading group has a negative BV.

Non-Trading Std Dev is €1,145k and the Trading group is €552k so that the spread between Non-Trading and Trading groups is noteworthy at 2.08X. This describes a disparity between Book Values of Non-Trading businesses and a moderately positively skewed distribution. The Trading group's positive skewness is somewhat more marked.

Total Assets

**Total
Assets**   **Non-Trading**

Fig 4.2a

**Total
Assets**   **Trading**
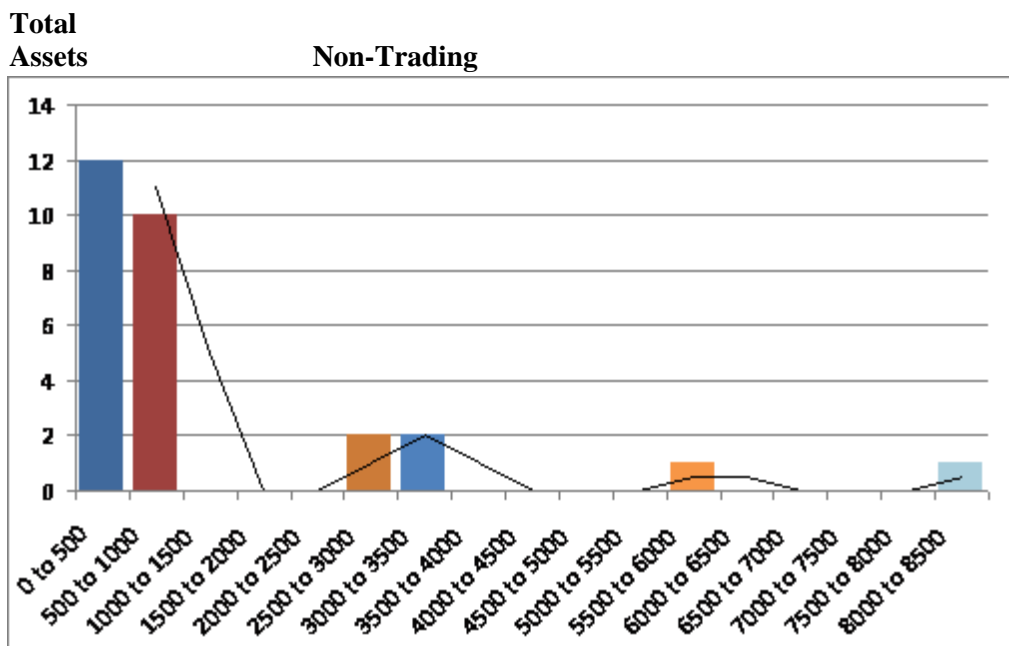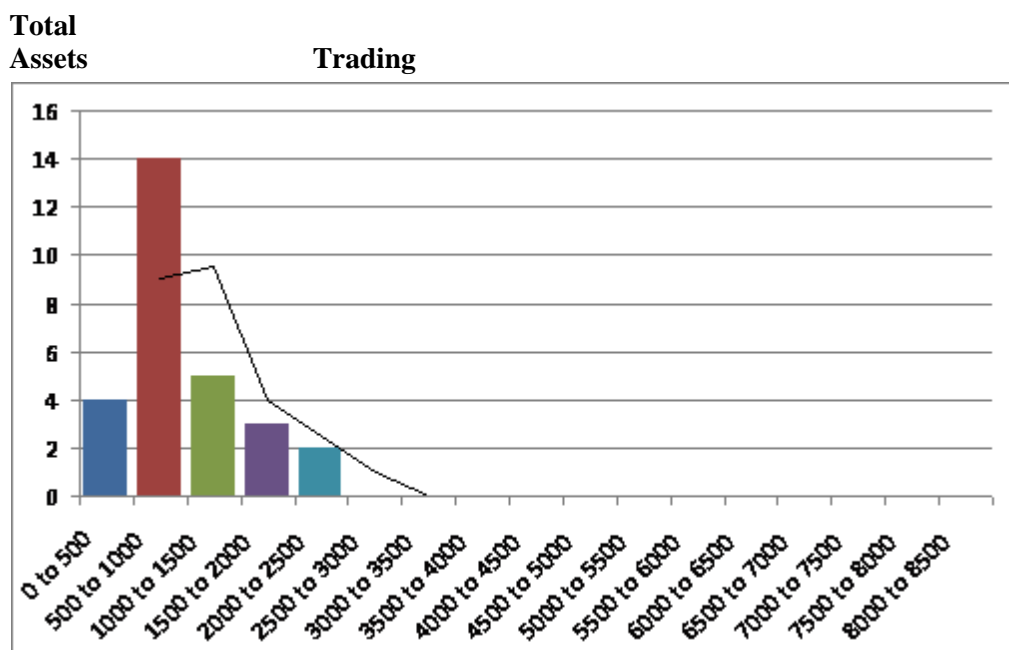
Fig 4.2b

The Non-Trading group has 12 companies with TA in the range €0k to €500k, while the Trading group has 4 in the same range. The Non-Trading group has 10 companies in the next range of €500k to €1,000k while the Trading group has 14.

The means are not dissimilar at €1,277k for the Non-Trading Group and €989k for Trading businesses. Medians are €550k and €911k respectively.

There is a substantial variation in Standard Deviation between each sample, with the Non-Trading Std Dev being 3.48X that of the Trading group at €1,919k for Non-Trading, and €551k for Trading companies. The Non-Trading Std Dev is noteworthy because distribution is heavily positively skewed by the existence of the 22 / 79% of businesses with TA of less than €1,000k and one business with TA of greater than €8,000k.

Total Liabilities
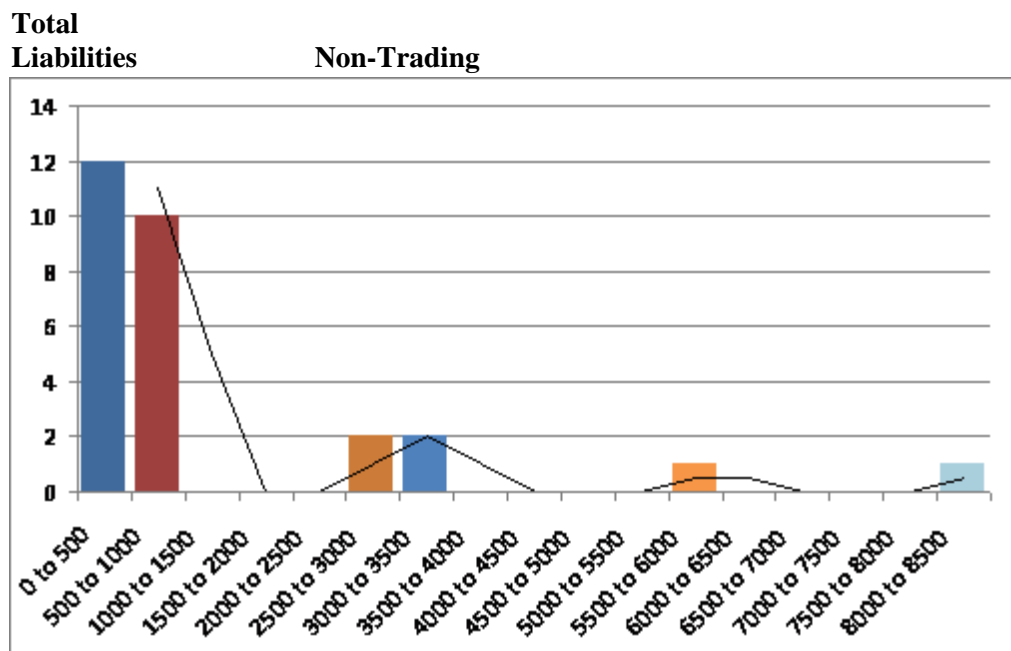
Fig 4.3a
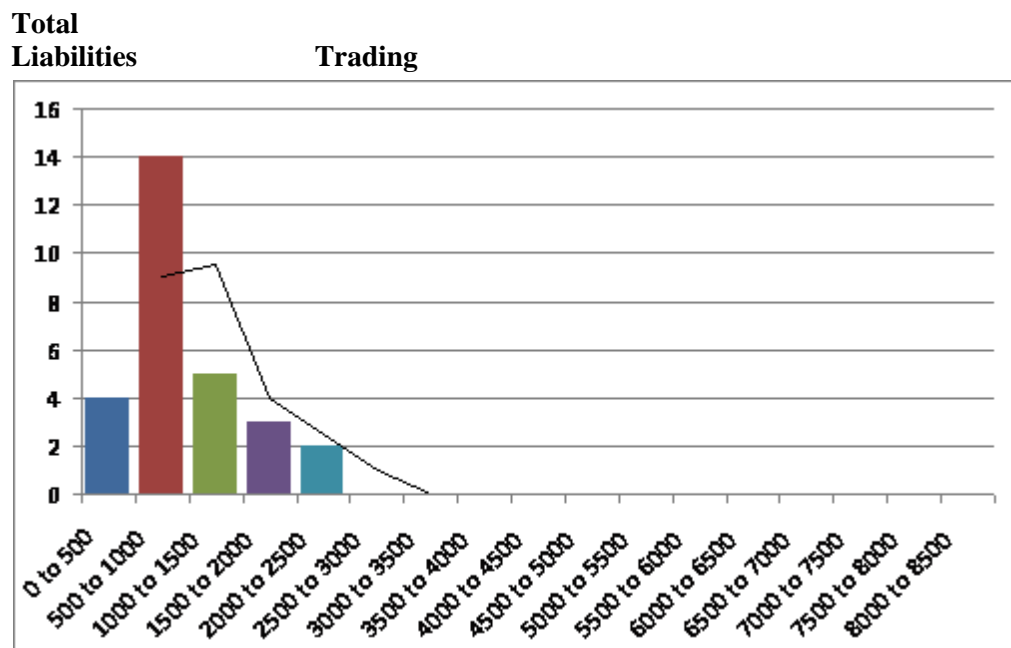
Fig 4.3b

22 / 79% of the Non-Trading group and 18 / 64% of the Trading group is comprised of businesses with TL obligations in the range of €0k to €1,000k.

The means are not comparable at €1,083k for Non-Trading and €472k for Trading businesses. Medians are €648k and €432k respectively.

There is a substantial variation in each sample Standard Deviation and each distribution is skewed positively this being substantially more marked in the Non-Trading group. Non-Trading Std Dev is €1,242k and Trading is €276k so that the deviation or spread between Non-Trading and Trading is noteworthy at 4.50X, heavily influenced by two individual outliers in the Non-Trading group at €€5,000k+ and €8,000k+. In contrast, the Trading group has no business with TL of greater than €2,500k.

Retained Earnings
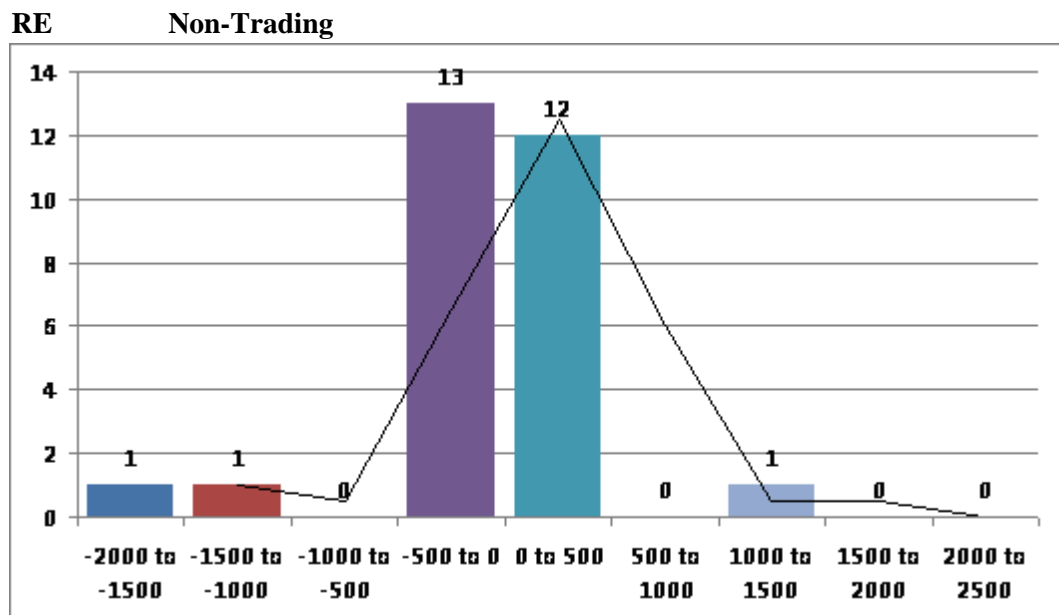
Fig 4.4a
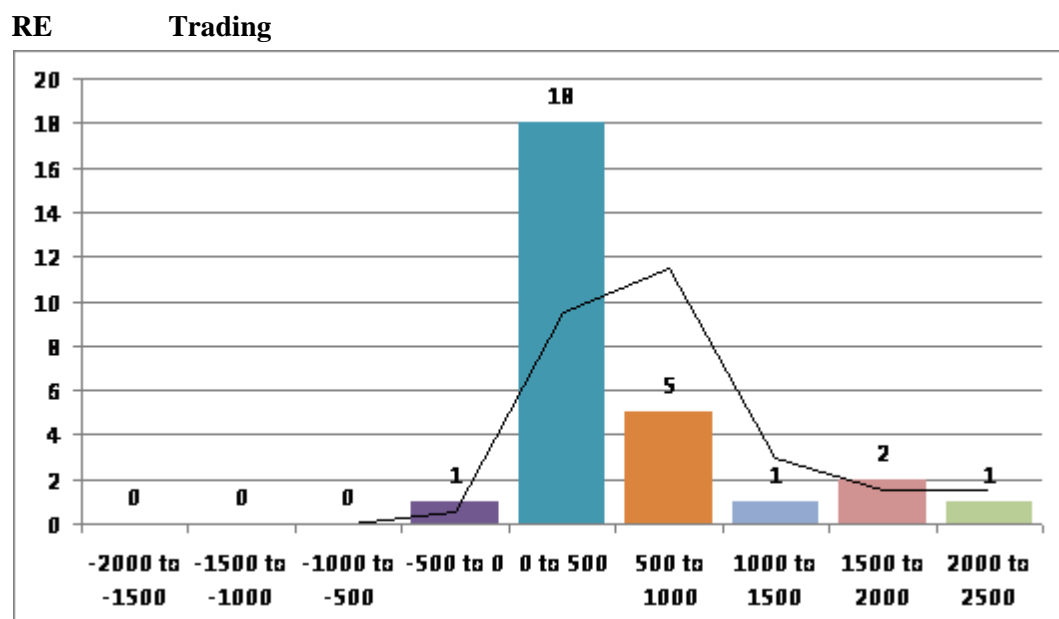
Fig 4.4b

25 / 89% of companies in the Non-Trading group are accounted for in the RE range of -€500k (13) to +€500k (12), while the Trading group has just 1 company in -€500k range and 18 in the €0k to €500k RE range.

The means are substantially different at -€102k of RE for the Non-Trading group and €477k for the Trading group.

Medians are -€30k for the Non-Trading Group and €337k for the Trading group.

Standard Deviations are similar to each other, Non-Trading is €556k and Trading is €577k. Non-Trading skewness is marginally negatively distributed. The Trading distribution is marginally positively skewed, with a very substantial clustering of performances (18 / 64%) in the €0k to €500k range.

Earnings Before Interest & Tax / Operating Profit

EBIT   Non-Trading
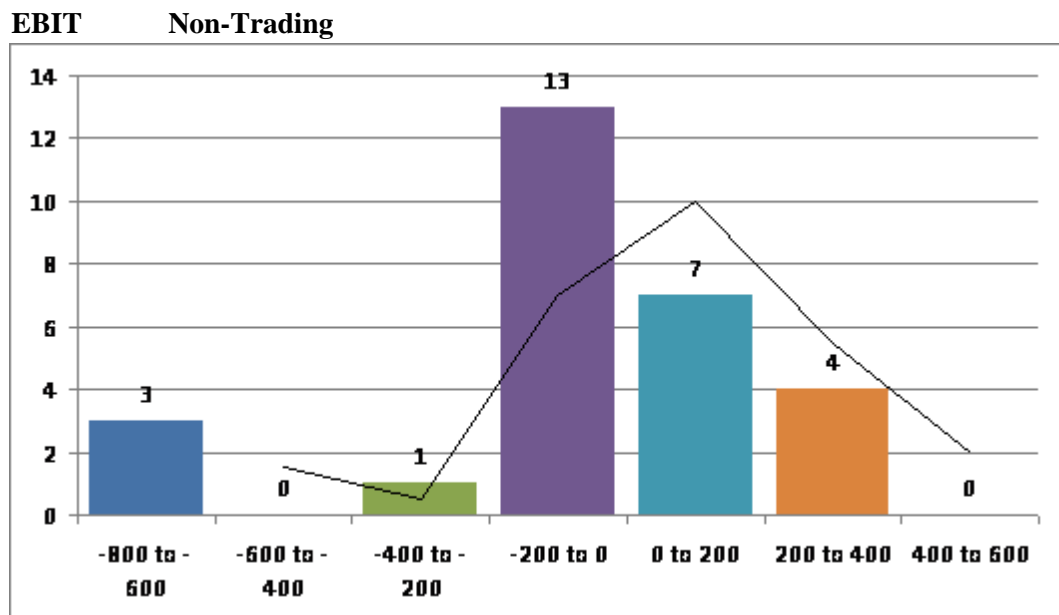
Fig 4.5a
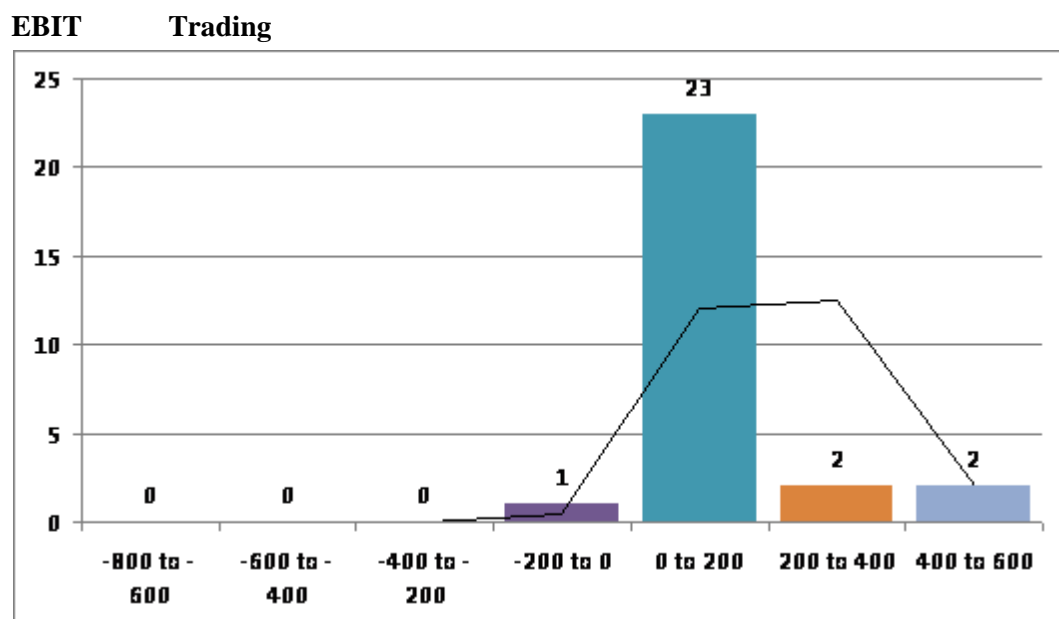
EBIT   Trading

Fig 4.5b

The Non-Trading group has 13 companies in the EBIT range of -€200k to €0k. The Trading group has just 1 loss-making company and it resides in this same range, -€200k to €0k. The Non-Trading group has 7 companies with an EBIT range of €0k to €200k while the Trading group has 23 companies in the same range of €0k to €200k.

The Non-Trading mean is -€64k and Trading mean is €99k. Medians are -€12k for Non-Trading and €46k for the Trading group.

There is a variation in Standard Deviation between each sample, where the Non-Trading Std Dev is 1.94X that of the Trading group while the numerical difference is quite modest, i.e. Std Dev of €266k for Non-Trading comparing with €137k for the Trading group.

Current Assets
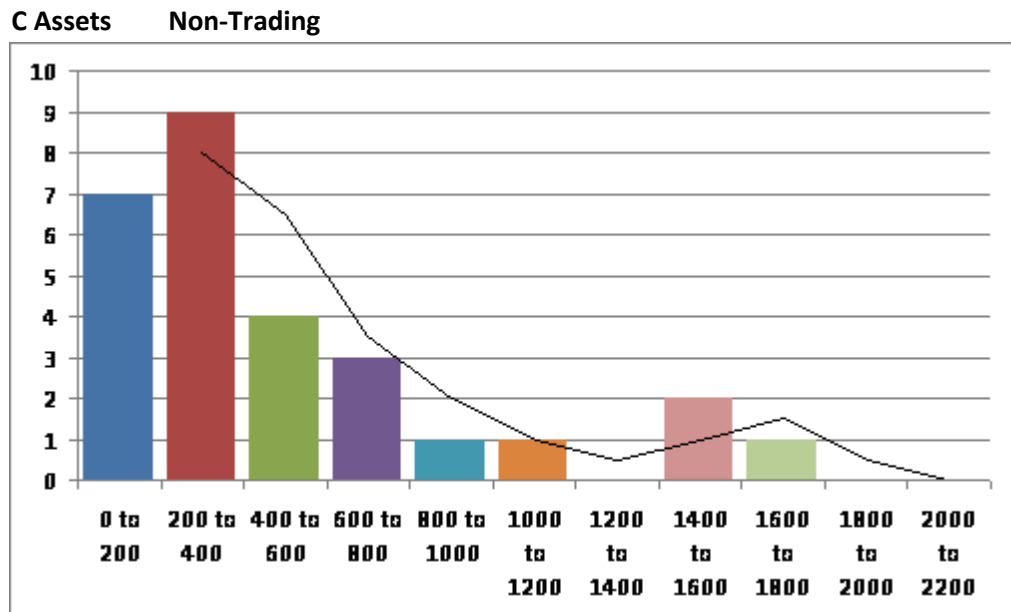
Fig 4.6a
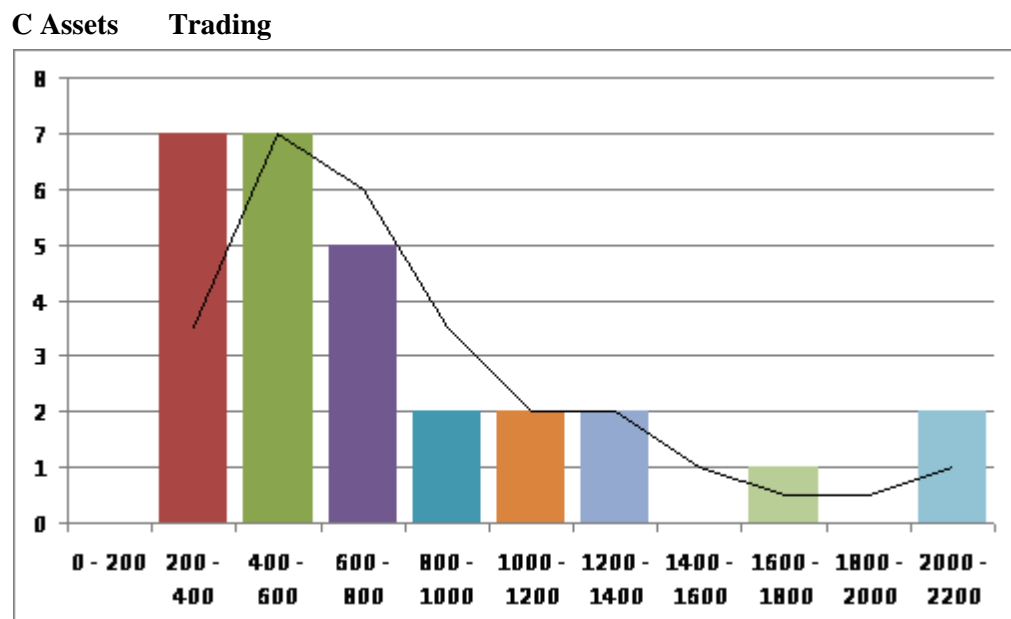
Fig 4.6b

The greatest number of constituent companies in the Non-Trading group is 9 in the €200k to €400k range, closely followed by 7 in the €0k to €200k range, representing 16 / 57% of that sample. The Trading group has no company in the €0k to €200k range and 7 each in the ranges of €200k to €400k and €400k to €600k representing 14

/ 50% of the Trading group sample. Means are €475k versus €763k for the Trading group.

Medians are €305k and €582k and influenced by a number of outliers in each group, as can be seen from the figure.

Standard Deviations are €462k (Non-Trading) and €530k (Trading), which is just a 13% difference, but when read with the mean information, plus the detail of clustering at low levels for Non-Trading in particular, plus the impact of the outliers, the differences between samples are illustrated.

Skewness is positive for both the Non-Trading and Trading groups and similar and outlier profile in the round is somewhat similar – Non-Trading having 3 businesses with CA of €1,400k to €1,800k and the Trading group having 2 businesses with CA profiles in the range €1,600k to €2,200k.

Current Liabilities

C Liab.   Non-Trading

Fig 4.7a

C Liab.   Trading
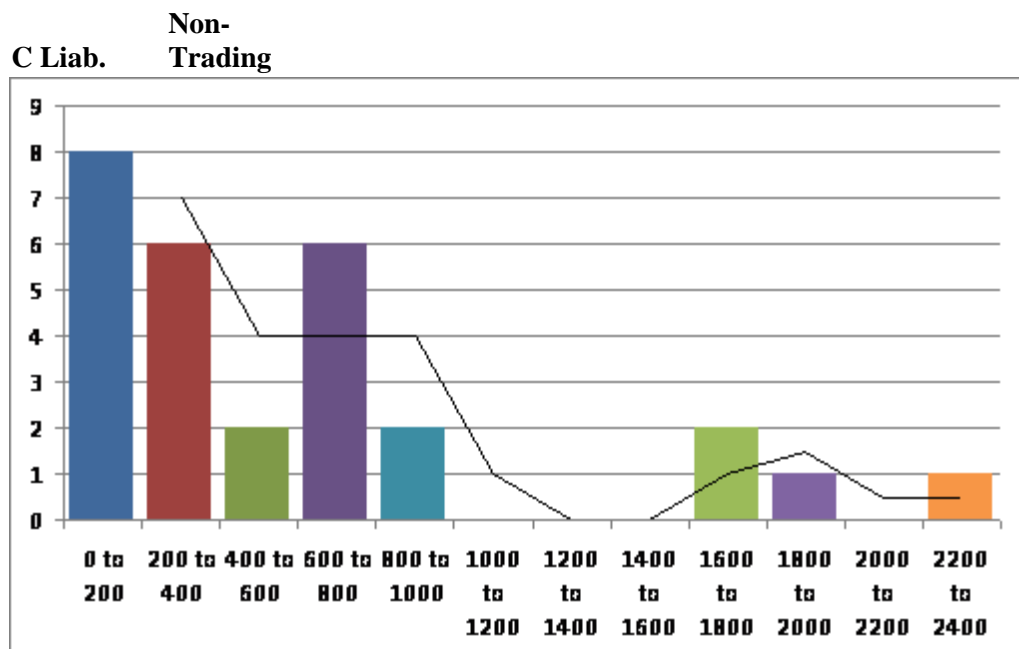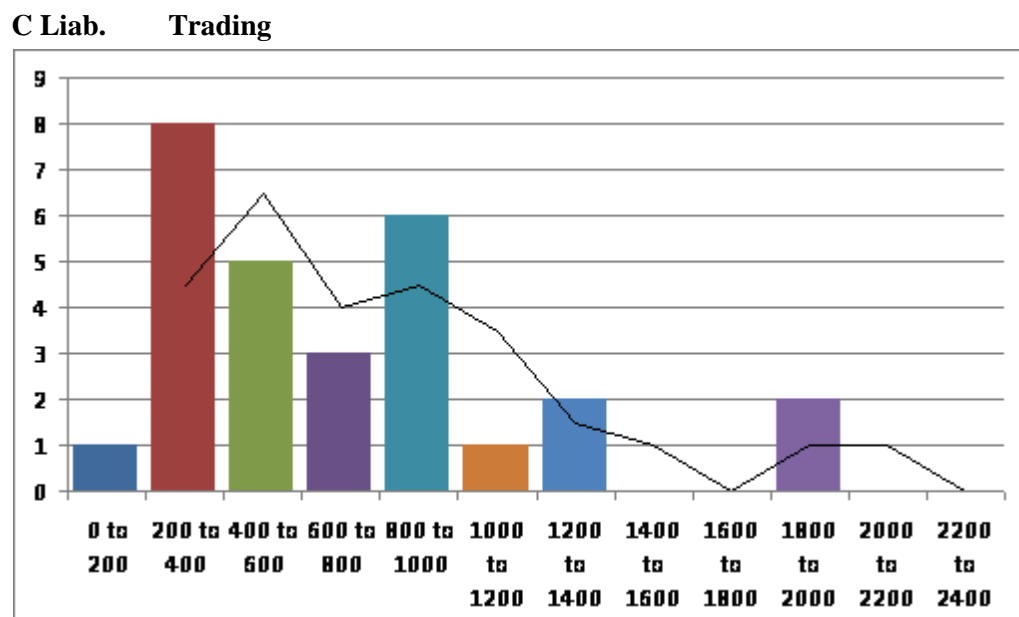
Fig 4.7b

The greatest number of constituent companies in the Non-Trading group is 8 and they have a Current Liabilities (CL) range of €0k to €200k, followed by 6 in the range of €200k to €400k; giving 14 or 50% of the sample. The Trading group has a not dissimilar profile, except that it has only 1 company in the €0k to €200k range with 8 businesses in the €200k to €400k range. Apart from outliers in the €1,000k + range,

where the Non-Trading group has 4 and Trading group, 5, each group has a broadly similar profile where 24 / 86% of the Non-Trading group and 23 / 82% of the Trading group companies CL are in the range €0k to €1,000k range. Medians at €404k and €294k respectively include some substantial outliers.

Means are €607k and €361k and illustrate that the Non-Trading businesses have on average greater CL obligations than the Trading counterparts.

Standard Deviations are €604k and €232k which is a 62% difference between the groups and illustrates a wider dispersion among the Non-Trading group.

Skewness is evident and is positive for each sample, slightly more skewed for the Non-Trading group with 4 outliers in the CL €1,600k to €2,400k range.

Working Capital

W. Cap   Non-Trading
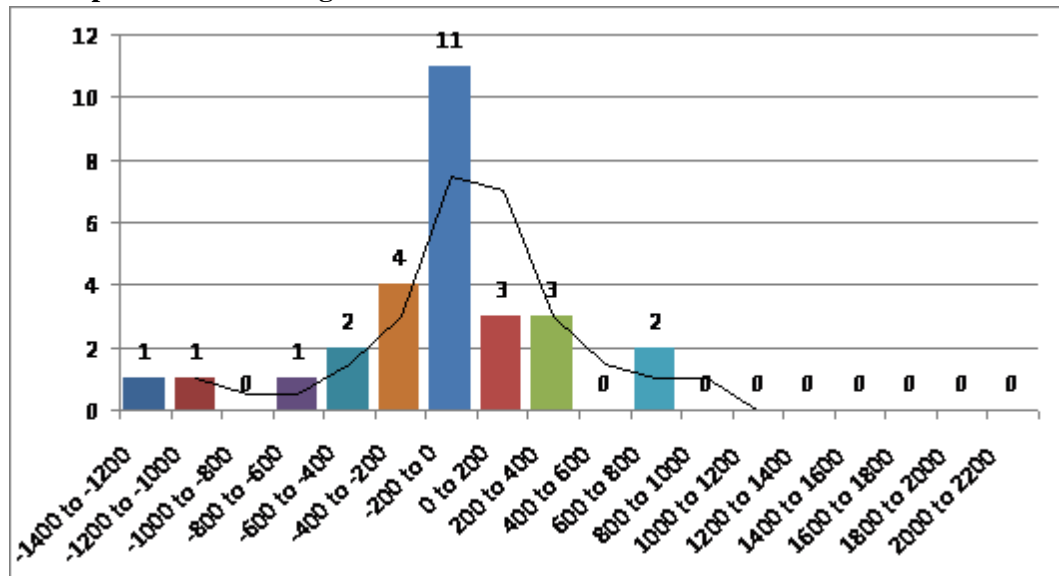
Fig 4.8a

W. Cap   Trading
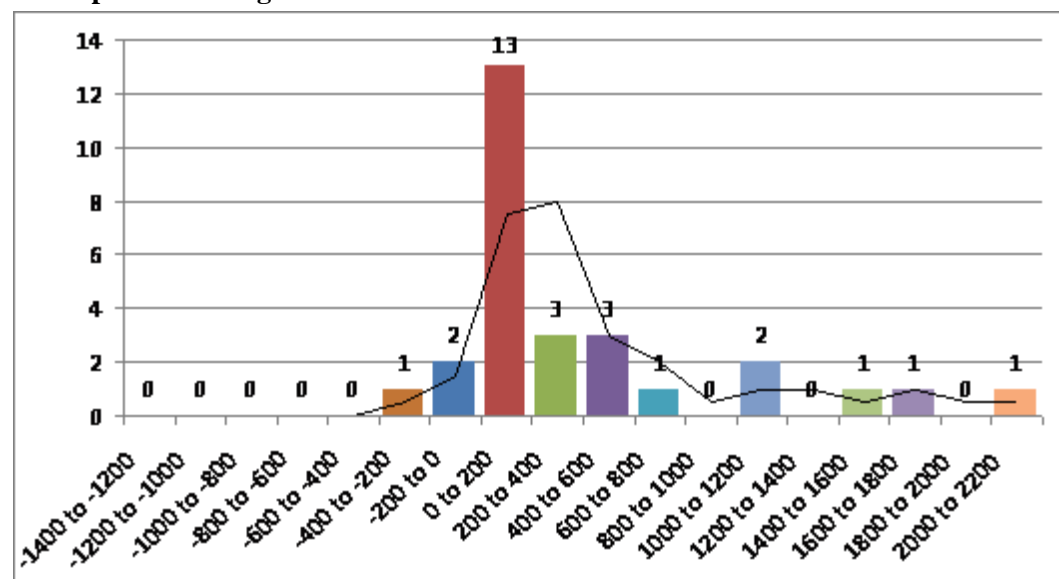
Fig 4.8b

The greatest number of constituent companies in the Non-Trading group is 11, with a Working Capital range of -€200k to €0. The Trading group has 13 companies in the range of €0k to €200k, i.e. between 39% and 46% respectively of each group resides close to zero with a relatively small monetary value separation between Non-trading (Failure) and Trading (Success).

The means are dissimilar, the Non-Trading mean is negative at -€133k and Trading mean is a positive €402k. The Non-Trading group has 14 / 50% companies in the range -€200k to €200k and the Trading group has 15 / 54% of companies in the same range, although the Non Trading group has 11 in negative WC while the Trading group has 13 in a positive WC position.

Medians are -€43k and €154k.

Standard Deviations are €421k and €570k which is a 26% difference.

Skewness is marginally negative for the Non-Trading group with two outliers at the negative -€1,000k to -€1,400k extremity. The Trading group skewness is positive with a positive tail / outlier of 1 business at the €2,000k to €2,200k WC level.

4.12 Tests of Normality

Tests of Normality

	TRADINGSTATUS	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
BV	Non-Trading	.238	28	.000	.620	28	.000
	Trading	.218	28	.002	.762	28	.000
TA	Non-Trading	.349	28	.000	.640	28	.000
	Trading	.159	28	.069	.913	28	.024
TL	Non-Trading	.277	28	.000	.748	28	.000
	Trading	.120	28	.200[*]	.937	28	.091
RE	Non-Trading	.183	28	.017	.849	28	.001
	Trading	.195	28	.008	.813	28	.000
EBIT	Non-Trading	.266	28	.000	.786	28	.000
	Trading	.202	28	.005	.717	28	.000
CA	Non-Trading	.196	28	.007	.838	28	.001
	Trading	.187	28	.013	.835	28	.000
CL	Non-Trading	.191	28	.011	.825	28	.000
	Trading	.165	28	.050	.873	28	.003
WCap	Non-Trading	.183	28	.017	.901	28	.012
	Trading	.232	28	.000	.785	28	.000

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Table 4.8

As previously noted, the data presented in tables 4.7a and 4.7b above, further illustrate that there were large differences between the mean and the median for each variable. Since there are different tests that are appropriate, depending on the normality of the distribution for each group sample, further analysis was required.

For each variable the respective distributions were investigated in order to assess the normality of the distributions.

In all cases we rely on the results from the Shapiro-Wilk's statistic to verify normality. All tests were undertaken at a 5% significance level. The Null Hypothesis associated with the Shapiro-Wilk's test of Normality is that the underlying distributions are normally distributed. As can be clearly seen from Table 2, in all cases with the exception of Total Revenues and Total Liabilities for Trading Companies there was sufficient evidence to reject the assumption of normality. As

such we proceed with the application of the non-parametric Mann-Whitney U Test to test for differences between distributions.

Test Statistics[a]

	BV	TA	TL	R	EBIT	CA	CL	WC
Mann-Whitney U	205.000	287.000	284.000	147.500	174.500	241.000	330.500	148.000
Wilcoxon W	611.000	693.000	690.000	553.500	580.500	647.000	736.500	554.000
Z	-3.065	-1.721	-1.770	-4.007	-3.564	-2.475	-1.008	-3.998
Asymp. Sig. (2-tailed)	.002	.085	.077	.000	.000	.013	.313	.000

a. Grouping Variable: TradingStatus

Table 4.9

The results of tests of difference with respect to distribution medians are presented in Table 3. All tests were undertaken at a 5% significance level. The Null Hypothesis associated with the Mann-Whitney U Test is that the distributions under consideration do not differ in their medians. In all cases, with the exception of Total Assets, Total Liabilities and Current Liabilities, there was sufficient evidence to reject the null hypothesis and as such we infer that there exists a significant difference between their respective medians. In the case of Total Assets and Total Liabilities, evidence of difference exists at a 10% significance level.

4.13 Z-Scores

Table 4.10a. Non-Trading Z-Scores	Z Weighting	=	WC/ TA 1.2	+	RE/ TA 1.4	+	EBIT/TA 3.3	+	BV/ TL 0.6	+	S / TA 1.0
n	28		28		28		28		28		28
Min	-28.82		-16.00		-22.05		-7.43		-0.56		0.00
Max	20.33		1.01		1.27		13.08		6.32		46.50
Mean	0.45		-1.44		-2.06		-0.15		0.23		3.88
Median	1.36		-0.25		-0.05		-0.08		-0.04		2.02
Std Dev	7.79		3.80		5.36		3.19		1.27		8.59

Table 4.10a

Table 4.10b. Trading Z-Scores	Z Weighting	=	WC/ TA 1.2	+	RE/ TA 1.4	+	EBIT/TA 3.3	+	BV/ TL 0.6	+	S / TA 1.0
N	28		28		28		28		28		28
Min	1.90		-0.19		-0.40		-0.35		0.08		0.68
Max	12.08		1.09		1.35		3.26		7.64		6.83
Mean	4.84		0.41		0.56		0.38		1.18		2.32
Median	4.05		0.32		0.52		0.22		0.46		1.81
Std Dev	2.78		0.39		0.44		0.64		1.86		1.60

Table 4.10b

The full information being analysed is available at Appendix 1

Score Range	Categorisation
$Z > 2.99$	Non Bankrupt or Safe Zone
$1.81 < Z < 2.99$	Zone of Ignorance or Gray Area
$Z < 1.81$	Bankrupt or Distress Zone

Table 4.10c. Altman Z-Scores Legend   (Altman 1968)

Table 4.10a (Non-Trading group) and 4.10b (Trading group) illustrate the workings and outcome of the Z-Score calculations for each group. It is apparent that the Non-Trading group mean Z-Score is 0.45, which is significantly below the 1.81 hurdle for Bankrupt or Distress Zone businesses, as identified and categorised by Altman.

The mean Z-Score for the Trading group companies is 4.84. The hurdle for Non Bankrupt or Safe Sector businesses is any outcome > 2.99.

From these results, it can be seen that there is a material difference between the two Z-Scores, that the scores are in the relevant ranges for Bankrupt / Distress Zone

businesses and Non Bankrupt or Safe Sector cases on this portfolio basis, comparing the Non-Trading group with the relevant Z-Score and the Trading group with 'its' Z-Score.

4.14 Independent Paired Samples Test

Independent Paired Samples Test

Table 4.11	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 Non-Trading - Trading	-4.389893	9.362104	1.769271	-8.020138	-.759648	-2.481	27	.020

Table 4.11

This table is informative from a research perspective. The Significance figure of 0.020 means that there is a difference between the groups (Non-Trading versus Trading) in the average Z-Scores that is statistically significant. A result of 0.020 means that there is only a 20/1000 chance that the result showing such a difference between the groups could have occurred by chance.

4.15 Hypothesis H1 Finding

Finding – H1

H1 – There is a statistically significant difference between the financial performance of Non-Trading and Trading SME businesses and their comparative likelihood of business failure as measured by the Altman Z-Score.

This Hypothesis is supported, based on the Table 4.11 result of the Significance figure of 0.020, which means that there is a difference between the Non-Trading versus Trading groups in the average Z-Scores that is statistically significant.

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The result of 0.020 means that there is only a 20/1000 chance that the result showing such a difference between the groups could have occurred by chance.

4.16 Hypothesis H2 Finding

Finding – H2

H2 – Financial Resilience - (measured by Retained Earnings and Earnings before Interest & Tax) of a Non-Trading SME business compared to a Trading business show significant differences which could indicate a likelihood of business failure.

TRADING STATUS	RE Mean	RE Median	EBIT Mean	EBIT Median
Non-Trading	-€102k	-€ 30k	-€ 64k	-€ 12k
Trading	€477k	€337k	€ 99k	€ 46k

Table 4.12

Without any sophisticated analysis, and by simply isolating the Means and Medians for RE (Retained Earnings) and EBIT (Earnings before Interest & Tax or Operating Profit), significant differences are apparent. Firstly, each measure for the Non-Trading group is Negative, illustrating that on average no profit was being retained in the business and in fact losses were occurring. This is reinforced by the EBIT numbers which confirm that on average operating losses were being made, rather than profits in the Non-Trading businesses.

This Hypothesis is supported, based on the summarised results above, which illustrate clear differences in the RE and EBIT performance between the two groups.

4.17 Hypothesis H3 Finding

H3 - Financial Liquidity (measured by Working Capital) of a Non-Trading SME business compared to a Trading business, show significant differences which could indicate a likelihood of business failure.

TRADING STATUS	WC Mean	WC Median
Non-Trading	-€133k	-€ 43k
Trading	€402k	€154k

Table 4.13

By isolating and comparing the Means and Medians for WC (Working Capital) significant differences are apparent. Each measure for the Non-Trading group is Negative, illustrating that on average current liabilities exceeded current assets and that on the face of it, further liquidity / cash was needed.

This Hypothesis is supported, based on the summarised results above, which illustrate clear differences in the WC performance between the two groups.

4.18 Summary

These findings and this study does not suggest or propose blind faith in these numbers alone (Altman 1968) although it does strongly promote the messages and learning within the numerical outcomes.

The next stage is to remind ourselves of the absence of a standardised method for assessment of credit risk and that there is no ideal method for credit risk assessment with various methods being adopted, each having particular 'strengths and weaknesses' (Kalapodas & Thompson 2006). The merits of a combined quantitative-led and qualitative-driven assessment protocol noting that a high number of assessment factors are 'qualitative' (Soares et al. 2011) return to the fore.

It is next proposed to discuss certain elements of the assessment undertaken to date in Chapter 5.

Chapter Five – Discussion

5.1 Community of Practice (CoP)

Participation and Observation in a CoP, together with information, opinion and observation of Key Informants led to the assessment of the existence of compelling evidence that a CoP was formed in this case.

The elements of a CoP were evident and strongly so, especially in Domain, Community and Practice.

The five critical success factors of CoP were observed together with two particular observations, one which is a challenge to the effective operation of a CoP, named the 'Firm Size Syndrome' whereby large firms operate differently by their nature and size to small firms and the other was observed to be a people management and coordination strength of the particular CoP and mitigant for the challenge of 'Firm Size Syndrome' (as the phrase has been coined).

This study proposes that there is a practical implication to the outcome in that a CoP in action can serve as an example of the benefits, in relation to commitment to the domain, shared competence that distinguishes members from other people, regular interaction and communal learning involving practitioners in a shared practice which takes time and sustained interaction to develop and nurture (Wenger 2007). This example highlights the importance of interaction and learning in the organisation as the true source of sustainable competitive advantage according to Drucker (1993). This CoP became united in action, in contrast to implementing 'fragmented best practices' (Liedtka 1999), and in this example, facilitated the further piece of work, represented by the Quantitative element of this combined study.

5.2 Non-Trading group.

Moving on to the quantitative element of this study; it is worthwhile reminding why making good credit decisions is of paramount importance for a financial institution

(briefly recapping that the majority of business activity conducted in Ireland is conducted by SMEs).

In general, when looking at data, if one believes that the most educational data may be found in the outliers or exceptions to what has been expected, the following discussion is relevant.

Looking at the highest Z-Score in the Non-Trading group, at 20.327 (i.e. an extremely high Safe Sector score), it is apparent that two elements of the Z-Score calculation in particular have contributed substantially to the final Z-Score outcome. These are the EBIT / TA score of 13.075, and the S/TA score of 7.717.

EBIT of €210k and Sales / Revenues of €409k when compared against TA of €53k have generated an overly positive outcome given that the business ceased trading shortly thereafter.

Looking at previous years, EBIT performance for this construction enterprise and noting that this is the last set of financial accounts for the business, this EBIT performance appears somewhat of an anomaly.

Without going further into this anomaly, it is apparent that further enquiry would be warranted if a credit decision were being made. In the three-pronged approach to credit decision-making running through this study, this means the other two elements are 'Market' and 'Management'. In this example, the market was residential construction.

The second-highest Z-Score result, at 9.126, went also to a construction company whose score outcome was most influenced by cash in the balance sheet of €266k, which influenced TA and MVE / BV numbers. In particular the MVE, BV / TL coefficient was 6.323 or 69% of the individual company Z-Score. In practice, turnover at €175k had steadily fallen nine-fold from six years previously and it appears that the cash was utilised elsewhere, which can happen in practice. It is also necessary to understand whether there is intercompany trading or a group company structure which if the case can mean the full business and financial picture is not clearly and fully apparent. In such cases, further enquiry is appropriate.

The third-highest Z-Score, at 7.590, was heavily influenced by the S/TA score of 5.381 and the EBIT/TA score of 3.003, and much less influenced by negative BV of -€116k and a negative WC position of -€184k. This was a logistics company and may have lost a major contract following as it did two consecutive loss making financial years. Research has shown that SMEs often depend on a small number of customers (Zontanos and Anderson 2004) and that this can be to their cost.

Cressy (2006) noted that a business should not be reliant on one or a small number of customers and therefore on the performance of a small number of trading counterparties. In practice, this is often not easily achieved and many enterprises commence because one party gives the enterprise an order, meaning at commencement there can only be one 'customer'. Similarly, Carland et al's (2001) argument could apply when he said that fraud in SMEs is largely underreported as a cause of business failure and that often (by their nature) SMEs have little resources and have material debt obligations so that failures may occur quickly.

These three examples demonstrate certain vagaries in the SME business activity in general and certain business sectors in particular, namely construction and logistics, which are highly cyclical and highly competitive sectors, with low barriers to entry. The restaurant sector is also highly competitive and cyclical.

Bank's cannot overlook or underinvest in the credit decision process and a decline in the credit standing of a 'bank's counterparties', which if missed by a bank's lax credit standards, poor portfolio risk management, or inattention to material economic or business changes, can cause serious banking problems (BIS 2000).

This reinforces the view (shared by this researcher from practical experience) that credit risk assessment is a multi-faceted activity and that at least three key headings for marshalling assessment apply, i.e. Financial performance, Market and Management (Soares et al. 2011).

5.3 Trading group

The three most positive outliers were successful service businesses at Z-Scores of 12.076, 10.959 and 10.088 respectively.

The principal discussion point from the Trading group is that they generally exhibit consistent very good performance under all performance measures. This in itself is a subject for further research, i.e. whether it is an ability of successful businesses to do (almost) everything well and not fall down in any one area?!

5.4 Non-Trading group compared to Trading Group.

Particular attention is drawn to the key measures referred in Hypothesis H1 and Hypothesis H2, where across the portfolio each measure of Retained earnings (RE), Earnings before Interest & Tax / Operating Profit (EBIT) and Working Capital (WC) for the Non-Trading business group was negative.

Using the same three measures, the Trading group had positive equivalents, underscoring a material and significant difference between the group performances. The point is made that this information was available by a simple calculation of Mean and Median for each item for each group. Put another way, this assessment could be carried out with a simple calculator upon basic Balance Sheet and Profit & Loss (Income) Statements information, by anyone.

5.5 Financial Resilience (H1)

In relation to SME businesses, it is worthwhile to focus again on 'Financial Resilience', which is this researcher's title for the RE and EBIT combined performance measure. The measure tells how much operating profit has been retained from previous year's performances and how much is made in the current year. It shows the business' profitability and indicates how much money it has been able to put away for reinvestment for lean times, amongst other things.

Again, these numbers warrant review to understand how they are calculated and for understanding, for example, how much the owners are paying themselves / drawing from the business and leaving in the business / being prudent.

5.6 Observation in relation to SME business general profitability

A further important sobering observation is that the monetary performance gap between the Non-Trading and Trading businesses (illustrated in Figs. 4.5a, 4.5b and Appendix 1) is quite small and noteworthy.

The Non-Trading group has 13 companies in the EBIT range of -€200k to €0k, i.e. generally lossmaking and 7 businesses making modest returns of EBIT of €0k to €200k. The Trading group has 23 companies in the same range of €0k to €200k.

These numbers illustrate in themselves the tight margin between success and failure in Irish SMEs and can serve to illustrate some of the challenges of managing a business, growing a business, responding to practical and strategic challenges and also generating a fund to withstand market and management issues which abound today.

With such a thin line between operating profit and operating loss, it may well be that small but ultimately material increases in 'strategic advantage' may end up being the distinguishing element of a business firm's future 'growth and decline or success and failure' (Darcy, Hill, McCabe and McGovern 2014).

CHAPTER SIX – Conclusions & Recommendation

'Credit assessment is not an exact science, and no one factor, ratio, or other indicator alone determines if a particular loan is a suitable risk.'

(Apostolik et al., 2009, p. 119)

6.1   Conclusion

This study aimed to help a financial services organisation to make better credit decisions. The findings demonstrate that there is compelling evidence that a Community of Practice was formed and carried out work that will in fact help the financial services organisation to make better credit decisions.

In addition, the Altman Z-Score methodology applied elsewhere has again demonstrated a statistically significant difference between the financial performance of Non-Trading and Trading SME businesses and their comparative likelihood of business failure.

Altman (1968) did not propose blind faith in a 'numerical score', rather, he stressed the model's simplicity, low cost and appropriateness to 'short-term' loan assessment or 'relatively small loans', where the cost of evaluation was expensive compared to income earned (Altman 1968).

The Altman Z-Score (1968) has most often been used to analyse large firms. In contrast, this particular study has incorporated assessment of Irish SME businesses, which is substantially smaller in scale than the US market. While this disparity in business size may support seeking a response to Hayes et al.'s (2010) challenge of whether or not smaller firms require a different (Z-Score) formula, the outcomes from this Irish SME study have supported the validity and applicability of the Z-Score model for Irish SMEs. In this way, the study has practical value for various stakeholders involved with SMEs. To be clear, this research study can be used to support SME businesses.

Given that a combination of various credit risk assessment methods (Kalapodas and Thomson 2006) and a combination of relevant assessment criteria such as financial, market and management measures (Soares et al. 2011) or past performance, financial standing and specific business competence (Burns and Fletcher 2008) is recommended by almost all academics and practitioners alike (including Altman, 1968, 2000). The evidence supports the argument that the Altman Z-Score model is a strong candidate for inclusion in any balanced assessment of credit risk, which by the evidence to date merits a qualitative and a quantitative dimension.

To recap, this study is partly an outcome from the application of a 45-year-old model, which is simple and cost-effective to use and apply, and which was designed originally for use on a business population of greater individual size and complexity than is comprised in this sample. Using actual company data, this model has returned a significant result.

In Ireland, perhaps more so than other countries, because SMEs 'account for 99.8% of all enterprises and 70% of private sector employment ' (Tyrrell, 2013), some judicious research and investment in appropriate modelling (taking the Altman work to date as a template) may pay dividends for Irish SME businesses and those financial institutions who support and lend to these businesses.

6.2 Recommendation

Building upon this research, a platform for a longitudinal study could be established in the near future, whereby interested parties would contribute to the knowledge pool in the area of SME performance, under, for example, the headings of

A)   Financial Performance including Z-Score MDA analysis modelling

B)   Market / Sector Conditions and Impacts

C)   Management Skills and Abilities.

From this initial structure, and by adopting a Community of Practice approach (framework built upon financial information), which is readily available and held by each and every business enterprise in some or other format, could be developed. In such a framework, interested stakeholders in SME-related business activity could contribute to an ongoing robust framework which would inform and guide business activity and especially the sensible access to credit and financial support when this is most needed by viable businesses, thereby contributing to making better credit decisions.

If it is accepted that success in business is to be promoted and encouraged, and that there is sufficient financial and other data currently available to learn from failure, then the challenge becomes one of using available data to recognise and avoid failure.

This study has illustrated how an Action Research approach can improve SME credit decisions, by combining qualitative work in a Community of Practice setting with quantitative analysis of SME accounting data. It is intended that this will provide the basis for other organisations to make better SME credit decisions.

GLOSSARY

Book Value (BV).

The total value of the company's assets that shareholders would theoretically receive if the company were wound up / liquidated.

Current Assets (CA).

The value of cash, receivable / debtors, inventories / stock and marketable securities or other assets which could be converted into cash within twelve months.

Current Liabilities (CL).

The value of amounts owed by the company for creditors / payables, interest, salaries and all other debt obligations payable within twelve months.

EBIT (Earnings Before Interest & Tax) aka Operating Profit.

The profit made by a company in a financial year on its business operations in a given year. It is the company's recurring revenue less recurring expenses.

Non-Trading (NonT), (NT).

A company which has made its last financial return and is no longer engaged in business activity.

Retained Earnings (R), (RE).

The value of the element of a company's profits kept and not spent or dispersed by the company so that this value is available for reinvestment or debt repayment or other usually business use. It can also be paid out in future.

SME
- No "hard and fast" definition.
- We use a definition used in some publications by Eurostat:
- Micro: < 10 employees.
- Small: $10 - 49$ employees.
- Medium: $50 - 249$ employees.
- Large: 250+ employees.
- Other definitions incorporate employment, turnover and asset thresholds.

- Central Bank lending data and Credit Review Office define SME as < 250 employees, < 50m turnover, < 43m balance sheet.'

Source (Lawless, M., McCann, F. & McIndoe-Calder, T. 'Irish SMEs: Stylised facts from the real economy and credit market'. *Central Bank of Ireland Slide # 4)*Available at http://www.centralbank.ie/stability/documents/sme%20conference/session%201/paper%202/presentation.pdf. [viewed 23 August 2014)

Total Assets (TA).

The value of all of a company's assets, i.e. land, buildings, investments, fixtures and fittings, equipment, receivables / debtors, intangibles and any other items of value owned by the company.

Total Liabilities (TL).

The value of a company's long-term debt, current debt and liabilities, together with any other liabilities / debts. All obligations to pay others.

Trading. (T).

A company which is actively going about is ordinary day to day business activity and paying its bills within normal trade terms.

Working Capital (WC).

The value of the difference between Curent Assets and Curtent Liabilities. Different treatment of itesm sych as cash and short term debt may mean that companies calculate Working Capital somewhat differently.

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Appendices

Appendix 1

All figures in €000s

A BLANK   Non-Trading

Y/e	Company	TOTAL REVENUES (SALES)	BV (of Net Assets or Equity)			Total Assets	Total Liabilities	Retained Earnings	EBIT / OP PROFIT	C Assets	C Liab.	W. Cap CA - CL
30/04/2012	NT1	1,405	-254			475	729	-389	-211	246	288	-42
30/12/2011	NT2	1,344	-304			583	887	-304	-53	552	765	-213
30/04/2009	NT3	3,164	774			3,383	2,609	-1,432	-783	861	1,964	-1,103
31/12/2011	NT4	294	-21			305	326	-21	14	287	326	-39
31/12/2011	NT5	6,885	731			3,225	2,494	256	224	1,538	2,276	-738
30/04/2011	NT6	186	-38			4	42	-63	-9	1	42	-41
31/12/2010	NT7	590	486			854	368	486	-141	444	242	202
31/12/2010	NT8	175	274			300	26	273	-6	279	26	253
31/05/2010	NT9	252	-391			117	508	-390	20	58	165	-107
31/10/2010	NT10	970	-26			324	350	-153	-17	282	326	-44
31/08/2010	NT11	23	-38			3	41	-38	-2	1	41	-40
31/12/2009	NT12	143	149			738	589	149	3	722	122	600
31/03/2011	NT13	1,424	-336			510	846	336	30	454	669	-215
31/12/2009	NT14	2,826	1,089			2,994	1,905	1,076	-668	1,458	809	649
30/06/2012	NT15	2,716	-1,921			517	2,438	-1,922	-742	291	1,637	-1,346
30/04/2007	NT16	409	-14			53	67	0	210	52	67	-15
31/08/2010	NT17	237	-330			110	440	-330	-17	32	440	-408
31/07/2009	NT18	0	-496			762	1,258	-496	-22	14	152	-138
30/04/2011	NT19	740	108			475	367	83	69	431	367	64
31/08/2009	NT20	7,037	-113			5,553	5,666	-113	266	318	767	-449
31/12/2008	NT21	3,388	5,348			8,426	3,078	136	-190	1,074	951	123
31/12/2009	NT22	462	-410			125	535	-410	-107	58	300	-242
31/07/2008	NT23	793	-37			671	708	-38	-45	356	701	-345
31/12/2008	NT24	1851	-116			344	460	0	313	273	457	-184
31/10/2009	NT25	6076	792			2549	1757	0	131	1623	1643	-20
28/02/2012	NT26	1131	200			970	770	136	-40	683	623	60
31/12/2009	NT27	1270	-139			670	809	-139	9	620	792	-172
30/06/2009	NT28	610	453			715	262	452	-14	284	45	239
												0
												0
												0
	n	28	28			28	28	28	28	28	28	31
	Min	0.0	-1,921.0			3.0	26.0	-1,922.0	-783.0	1.0	26.0	-1,346.0
	Max	7,037.0	5,348.0			8,426.0	5,666.0	1,076.0	313.0	1,623.0	2,276.0	649.0
	Mean	1,657.2	193.6			1,277.0	1,083.4	-102.0	-63.5	474.7	607.3	-119.7
	Median	881.5	-31.5			550.0	648.5	-29.5	-11.5	304.5	403.5	-41.0
	Std Dev	2,013.2	1,151.1			1,919.3	1,241.8	556.2	265.5	461.7	603.6	401.5

		Z	=	1.2 X_1	+	1.4X_2	+	3.3X_3	+	0.6X_4	+	1.0X_5

A BLANK

Non-Trading
Z Scores

		Co-efficient		WC/TA	+	RE/TA	+	EBIT/TA	+	MVE/TL	+	S/TA
		Weighting		1.2		1.4		3.3		0.6		1.0
	Company	Z										
30/04/2012	NT1	0.030	=	-0.106	+	-1.147	+	-1.466	+	-0.209	+	2.958
30/12/2011	NT2	0.631	=	-0.438	+	-0.730	+	-0.300	+	-0.206	+	2.305
30/04/2009	NT3	-0.634	=	-0.391	+	-0.593	+	-0.764	+	0.178	+	0.935
31/12/2010	NT4	0.827	=	-0.153	+	-0.096	+	0.151	+	-0.039	+	0.964
31/12/2011	NT5	2.376	=	-0.275	+	0.111	+	0.229	+	0.176	+	2.135
30/04/2011	NT6	4.182	=	-12.300	+	-22.050	+	-7.425	+	-0.543	+	46.500
31/12/2010	NT7	2.019	=	0.284	+	0.797	+	-0.545	+	0.792	+	0.691
31/12/2010	NT8	9.126	=	1.012	+	1.274	+	-0.066	+	6.323	+	0.583
31/05/2010	NT9	-3.508	=	-1.097	+	-4.667	+	0.564	+	-0.462	+	2.154
31/10/2010	NT10	1.952	=	-0.163	+	-0.661	+	-0.173	+	-0.045	+	2.994
31/08/2010	NT11	-28.823	=	-16.000	+	-17.733	+	-2.200	+	-0.556	+	7.667
31/12/2009	NT12	1.617	=	0.976	+	0.283	+	0.013	+	0.152	+	0.194
31/03/2011	NT13	3.164	=	-0.506	+	0.922	+	0.194	+	-0.238	+	2.792
31/12/2009	NT14	1.314	=	0.260	+	0.503	+	-0.736	+	0.343	+	0.944
30/06/2012	NT15	-8.284	=	-3.124	+	-5.205	+	-4.736	+	-0.473	+	5.253
30/04/2007	NT16	20.327	=	-0.340	+	0.000	+	13.075	+	-0.125	+	7.717
31/08/2010	NT17	-7.456	=	-4.451	+	-4.200	+	-0.510	+	-0.450	+	2.155
31/07/2009	NT18	-1.460	=	-0.217	+	-0.911	+	-0.095	+	-0.237	+	0.000
30/04/2011	NT19	2.620	=	0.162	+	0.245	+	0.479	+	0.177	+	1.558
31/08/2009	NT20	1.288	=	-0.097	+	-0.028	+	0.158	+	-0.012	+	1.267
31/12/2008	NT21	1.410	=	0.018	+	0.023	+	-0.074	+	1.042	+	0.402
31/12/2009	NT22	-6.504	=	-2.323	+	-4.592	+	-2.825	+	-0.460	+	3.696
31/07/2008	NT23	0.233	=	-0.617	+	-0.079	+	-0.221	+	-0.031	+	1.182
31/12/2008	NT24	7.590	=	-0.642	+	0.000	+	3.003	+	-0.151	+	5.381
31/10/2009	NT25	2.814	=	-0.009	+	0.000	+	0.170	+	0.270	+	2.384
28/02/2012	NT26	1.456	=	0.074	+	0.196	+	-0.136	+	0.156	+	1.166
31/12/2009	NT27	1.238	=	-0.308	+	-0.290	+	0.044	+	-0.103	+	1.896
30/06/2009	NT28	3.112	=	0.401	+	0.885	+	-0.065	+	1.037	+	0.853

	Table 4a	Z	=	WC/TA	+	RE/TA	+	EBIT/TA	+	BVE/TL	+	S/TA
	Non Trading Z Scores											
	n	28		28		28		28		28		28
	Min	-28.82		-16.00		-22.05		-7.43		-0.56		0.00
	Max	20.33		1.01		1.27		13.08		6.32		46.50
	Mean	0.45		-1.44		-2.06		-0.15		0.23		3.88
	Median	1.36		-0.25		-0.05		-0.08		-0.04		2.02
	Std Dev	7.79		3.80		5.36		3.19		1.27		8.59

		DATABASE FOR Z SCORES										

27.8.14 DATABASE FOR Z SCORES

All figures in €000s

C Blank   Trading

Y/e	Company	TOTAL REVENUES (SALES)	BV (of Net Assets or Equity)			Total Assets	Total Liabilities	Retained Earnings	EBIT	C Assets	C Liab.	W. Cap CA - CL
30/12/2012	T1	2,344	576			1,135	559	576	10	1,135	559	576
31/12/2012	T2	1,694	656			1,295	639	657	38	1,273	237	1,036
31/03/2013	T3	1,564	494			967	473	494	31	289	249	40
30/06/2012	T4	2,014	47			295	248	46	22	287	248	39
30/11/2012	T5	3,300	358			946	588	359	59	617	423	194
31/12/2011	T6	1,552	225			500	275	225	2	431	262	169
30/09/2012	T7	2,272	141			586	445	37	48	461	438	23
31/03/2013	T8	783	111			635	524	111	124	384	457	-73
30/04/2013	T9	1,198	130			515	385	1	3	283	326	-43
31/12/2012	T10	1,784	112			870	758	111	32	846	498	348
30/06/2012	T11	1,608	2,177			2,348	171	2,177	215	2,192	171	2,021
31/12/2012	T12	3,992	1,891			2,308	417	1,815	42	2,058	342	1,716
30/09/2012	T13	2,645	520			938	418	257	151	844	418	426
31/12/2012	T14	1,723	129			907	778	-257	98	775	637	138
31/10/2012	T15	932	1,131			1,351	220	1,093	19	1,247	220	1,027
31/05/2012	T16	1,233	517			1,236	719	455	11	661	644	17
31/12/2013	T17	697	315			915	600	315	112	513	130	383
28/02/2013	T18	2,125	428			525	97	430	518	525	97	428
31/08/2013	T19	957	84			610	526	0	156	487	192	295
30/06/2013	T20	1,696	139			1,219	1,080	71	83	1,069	940	129
30/04/2013	T21	910	238			467	229	237	-50	260	130	130
30/06/2013	T22	2690	52			429	377	52	17	428	377	51
31/05/2012	T23	2386	523			1613	1090	523	528	733	982	-249
30/06/2012	T24	1059	662			796	134	662	234	757	134	623
30/06/2013	T25	1787	748			1637	889	748	85	547	484	63
31/12/2012	T26	1256	81			253	172	80	43	238	172	66
28/02/2013	T27	2329	1,575			1731	156	1666	129	1731	156	1,575
31/12/2012	T28	1260	414			662	248	404	24	278	172	106

		TOTAL REVENUES	BV			Total Assets	Total Liabilities	Retained Earnings	EBIT	C Assets	C Liab.	W. Cap
	n	28	28			28	28	28	28	28	28	28
	Min	697.0	47.0			253.0	97.0	-257.0	-50.0	238.0	97.0	-249.0
	Max	3,992.0	2,177.0			2,348.0	1,090.0	2,177.0	528.0	2,192.0	982.0	2,021.0
	Mean	1,778.2	516.9			988.9	472.0	476.6	99.4	762.5	360.5	401.9
	Median	1,695.0	386.0			911.0	431.5	337.0	45.5	582.0	294.0	153.5
	Std Dev	778.2	551.5			551.2	275.8	576.9	136.6	529.6	231.8	569.9

Z	=	1.2 X$_1$	+	1.4X$_2$	+	3.3X$_3$	+	0.6X$_4$	+	1.0X$_5$

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TABLE 4b

Z Scores

		Co-efficient	WC/TA	+	RE/TA	+	EBIT/TA	+	MVE/TL	+	S/TA
		Weighting	1.2		1.4		3.3		0.6		1.0
	Company	Z									
30/12/2012	T1	4.032	=	0.609	+	0.710	+	0.029	+	0.618	+	2.065
31/12/2012	T2	3.691	=	0.960	+	0.710	+	0.097	+	0.616	+	1.308
31/03/2013	T3	3.115	=	0.050	+	0.715	+	0.106	+	0.627	+	1.617
30/06/2012	T4	7.564	=	0.159	+	0.218	+	0.246	+	0.114	+	6.827
30/11/2012	T5	4.837	=	0.246	+	0.531	+	0.206	+	0.365	+	3.488
31/12/2011	T6	4.644	=	0.406	+	0.630	+	0.013	+	0.491	+	3.104
30/09/2012	T7	4.473	=	0.047	+	0.088	+	0.270	+	0.190	+	3.877
31/03/2013	T8	2.111	=	-0.138	+	0.245	+	0.644	+	0.127	+	1.233
30/04/2013	T9	2.451	=	-0.100	+	0.003	+	0.019	+	0.203	+	2.326
31/12/2012	T10	2.919	=	0.480	+	0.179	+	0.121	+	0.089	+	2.051
30/06/2012	T11	10.957	=	1.033	+	1.298	+	0.302	+	7.639	+	0.685
31/12/2012	T12	6.504	=	0.892	+	1.101	+	0.060	+	2.721	+	1.730
30/09/2013	T13	5.026	=	0.545	+	0.384	+	0.531	+	0.746	+	2.820
31/12/2012	T14	2.142	=	0.183	+	-0.397	+	0.357	+	0.099	+	1.900
31/10/2012	T15	5.866	=	0.912	+	1.133	+	0.046	+	3.085	+	0.690
31/05/2012	T16	1.990	=	0.017	+	0.515	+	0.029	+	0.431	+	0.998
31/12/2013	T17	2.465	=	0.502	+	0.482	+	0.404	+	0.315	+	0.762
28/02/2013	T18	12.076	=	0.978	+	1.147	+	3.256	+	2.647	+	4.048
31/08/2013	T19	3.089	=	0.580	+	0.000	+	0.844	+	0.096	+	1.569
30/06/2013	T20	1.902	=	0.127	+	0.082	+	0.225	+	0.077	+	1.391
30/04/2013	T21	3.263	=	0.334	+	0.710	+	-0.353	+	0.624	+	1.949
30/06/2013	T22	6.796	=	0.143	+	0.170	+	0.131	+	0.083	+	6.270
31/05/2012	T23	3.116	=	-0.185	+	0.454	+	1.080	+	0.288	+	1.479
30/06/2012	T24	7.368	=	0.939	+	1.164	+	0.970	+	2.964	+	1.330
30/06/2013	T25	2.454	=	0.046	+	0.640	+	0.171	+	0.505	+	1.092
31/12/2012	T26	6.564	=	0.313	+	0.443	+	0.561	+	0.283	+	4.964
28/02/2013	T27	10.088	=	1.092	+	1.347	+	0.246	+	6.058	+	1.345
31/12/2012	T28	4.071	=	0.192	+	0.854	+	0.120	+	1.002	+	1.903

Table 4b Trading Z Scores	Z	=	WC/TA	+	RE/TA	+	EBIT/TA	+	BVE/TL	+	S/TA
n	28		28		28		28		28		28
Min	1.90		-0.19		-0.40		-0.35		0.08		0.68
Max	12.08		1.09		1.35		3.26		7.64		6.83
Mean	4.84		0.41		0.56		0.38		1.18		2.32
Median	4.05		0.32		0.52		0.22		0.46		1.81
Std Dev	2.78		0.39		0.44		0.64		1.86		1.60

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Table 4.10a Non Trading Z Scores	Z Weighting	=	WC/TA 1.2	+	RE/TA 1.4	+	EBIT/TA 3.3	+	BVE/TL 0.6	+	S/TA 1.0
n	28		28		28		28		28		28
Min	-28.82		-16.00		-22.05		-7.43		-0.56		0.00
Max	20.33		1.01		1.27		13.08		6.32		46.50
Mean	0.45		-1.44		-2.06		-0.15		0.23		3.88
Median	1.36		-0.25		-0.05		-0.08		-0.04		2.02
Std Dev	7.79		3.80		5.36		3.19		1.27		8.59

Table 4.10b Trading Z Scores	Z Weighting	=	WC/TA 1.2	+	RE/TA 1.4	+	EBIT/TA 3.3	+	BVE/TL 0.6	+	S/TA 1.0
n	28		28		28		28		28		28
Min	1.90		-0.19		-0.40		-0.35		0.08		0.68
Max	12.08		1.09		1.35		3.26		7.64		6.83
Mean	4.84		0.41		0.56		0.38		1.18		2.32
Median	4.05		0.32		0.52		0.22		0.46		1.81
Std Dev	2.78		0.39		0.44		0.64		1.86		1.60

Appendix 2

Cultivating communities of practice
a quick start-up guide
by Etienne Wenger

Where to start?

What are communities of practice?

Communities of practice are groups of people who share a passion for something that they know how to do and who interact regularly to learn how to do it better.

What elements to develop?

Domain: the definition of the area of shared inquiry and of the key issues

Community: the relationships among members and the sense of belonging

Practice: the body of knowledge, methods, stories, cases, tools, documents

set strategic context

A strategic context lets communities find a legitimate place in the organization

- Articulate a strategic value proposition
- Identify critical business problems
- Articulate need to leverage knowledge

educate

Communities of practice are a familiar experience, but people need to understand how they fit in their work.

- Conduct workshops to educate management and potential members about the approach
- Help people appreciate how communities of practice are inherently self-defined and self-managed
- Establish a language to legitimize communities and establish their place in the organization

integrate

The formal organization must have processes and structure to include these communities while honoring their root in personal passion and engagement.

- Integrate communities in the way the organization works
- Identify and remove obvious barriers
- Align key structural and cultural elements

support

Communities of practice can use some light-handed guidance and technology infrastructure.

- Provide some process support, coaching, and logistic assistance
- Identify needs and define adequate infrastructure without undue emphasis on fancy technology

encourage

Practitioners usually see the value of working as a community but may feel the organization is not aligned with their understanding.

- Find sponsors to encourage participation
- Value the work of communities
- Publicize successes

get going

Starting to cultivate communities of practice as early as possible creates early examples that allow people to learn by doing.

- Have a few pilot communities going as soon as possible
- Find communities to start with by identifying areas where there is potential and readiness
- Interview some prospective members to understand issues, start discussing a community, and identify potential leaders
- Gather a core group to prepare and initiate a launch process
- Help members organize an initial series of value-adding activities
- Encourage them to take increasing responsibility for stewarding their knowledge

Why focus on communities of practice?

	short-term value	long-term value
members	• help with challenges • access to expertise • confidence • fun with colleagues • meaningful work	• personal development • reputation • professional identity • network • marketability
organization	• problem solving • time saving • knowledge sharing • synergies across units • reuse of resources	• strategic capabilities • keeping abreast • innovation • retention of talents • new strategies

What are some critical success factors?

community

- Domain that energizes a core group
- Skillful and reputable coordinator
- Involvement of experts
- Address details of practice
- Right rhythm and mix of activities

organization

- Strategic relevance of domain
- Visible management sponsorship, but without micro-management
- Dance of formal and informal structures
- Adequate resources
- Consistent attitude

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