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OWNERSHIP & CONTROL

Postal Address:

Postal Box 36
Sumy 40014
Ukraine

Tel: +380-542-698125
Fax: +380-542-698125
e-mail: alex_kostyuk@virtusinterpress.org
www.virtusinterpress.org

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CONTENTS

CUSTOMER EXPECTATIONS AND SERVICE DELIVERY: ARE SME'S AWARE OF THE SERVICE QUALITY STANDARDS GAP?

Johannes A Wiid*, Michael C Cant**, Carly Prinsloo***

Abstract

Competition among small businesses are high, as small businesses compete for market share which larger business do not engage with. A definite competitive advantage that small and medium enterprises (SMEs) can rely on is service quality (Kasul & Motwani in Anuar & Yusuff 2011:328; Tseng & Wu 2014:77). SMEs do not necessarily understand service standards and how to ensure that the service standard is implemented. The research utilised a quantitative research design whereby the data was collected by means of a 5-point Likert scale survey known as the SERVQUAL model. The results indicate that there are discrepancies between dimensions those owners feel should be adhered to and the extent to which they perceive their businesses to adhere to these dimensions.

Keywords: Service Quality, Small and Medium Enterprises (SMEs), Standards Gap

**Department of Marketing and Retail Management, University of South Africa (Unisa), Pretoria*
Tel: +2712 429 3939
***Department of Marketing and Retail Management, University of South Africa (Unisa), Pretoria*
Tel: +2712 429 4456
****Department of Marketing and Retail Management, University of South Africa (Unisa), Pretoria*
Tel: +2712 429 8677

1 Introduction

Heightened levels of competitive pressure, as a result of globalisation and thus increased productivity, make it necessary for businesses to make their total product and service offerings more competitive (Owusu-Frimpong & Nwankwo, 2012:682). In many instances these companies were offering the same products even from the same suppliers, leaving very little room for differentiation. Small businesses cannot rely solely on meeting the basic requirements to deliver a product or service to customers, but also have to have a greater understanding of customer needs, customers' expectations, the market place and the competitive environment (Found & Harrison, 2012:256). To focus on customer expectations will provide a backdrop against which a small business can attempt to differentiate itself from others.

Customer expectations are the customer's beliefs about a service encounter's outcomes before having experienced the actual service encounter (Kim & Mattila, 2013:362; Forsythe, 2012:589). Expectations are influenced by a number of aspects such as personal experiences, advertising, information searches and word-of-mouth communication (Guiry, Scott & Vequist, 2013:434). As technology changes and globalisation makes it easier to provide services to customers, customers have a raised expectation which may have an impact on future customer satisfaction evaluations (Madupalli & Poddar, 2014:245; Kim & Mattila, 2013:361). To counter the effects of rapid changing expectations improved service quality can be utilised.

Improving service quality is an important survival and growth mechanism for small businesses as it assists in facing competitors with a sustainable competitive advantage (Owusu-Frimpong & Nwankwo, 2012:684; Shahin, Attafar & Samea, 2012:84; Tseng & Wu, 2014:77), especially considering that service quality is a measure of performance of a business (Kasul & Motwani in Anuar & Yusuff, 2011:328). Keeping in mind that customers always have a certain expectation in terms of service, therefore if the service is below their expectations then the service quality is deemed as poor. Conversely, if the service is perceived to be above expectation, then the service is deemed as being of a high quality – resulting in a higher level of customer satisfaction. Globalisation, decreased product life cycles, better-informed customers, and increased costs have created an environment where businesses need to be flexible, adaptive, responsive and innovative in terms of service delivery (Anuar & Yusuff, 2011:325). Linked to service quality is the quality reputation that a business takes on with its quality performance. A quality reputation creates customer loyalty, permits product differentiation and offers positioning advantages (Ndubisi & Iftikhar, 2012:219; Shahin et al, 2012:86). Superior quality performance is an important source of differentiation and a desirable variable for most businesses (Ndubisi & Iftikhar, 2012:216). With all the advantages and

additional competitive stances that quality service offers to SMEs, there is still a level of confusion among managers and owners of SMEs regarding service quality standards. This can and will lead to employees being misinformed regarding what these service quality standards are, and may result in customer expectations not being met (Machado & Diggines, 2012:127). The net effect of this is that there is a gap that forms between what the customer expects and what is delivered by the business. In such a scenario the gap that forms is called a service quality gap, which is something any business would like to avoid as it can and will affect its competitive advantage.

This study attempts to establish what SME owners' understanding of expected service quality entails and what actual level of service delivery is provided to SME customers – that is, to establish if there is a gap between customer expectation and service delivery. The literature encompasses background on SMEs, the service quality concept, as well as the gap model linked to service quality. Additionally, objectives, research methodology and the resulting findings will follow before concluding the paper.

2 Small and medium enterprises service quality

South Africa's small business sector employs roughly 68% of the total number of economically active workers in South Africa (Adcorp, 2012:1). Small and medium enterprises (SMEs) are considered an important originator of jobs in South Africa and therefore an important contributor to economic growth, innovation, poverty alleviation and a driving force behind economic development in the country (Edvardsson & Teitsdóttir, 2015:30). Competitiveness has necessitated that small businesses constantly pursue best practices efficiently, including terms of operational processes, products and services to adapt to a flexible and responsive consumer market (Teixeira, Lopes & Sousa, 2015:2). Outsourcing utilised by larger companies during the recession highlighted the importance of small businesses as it meant that small businesses contributed in terms of reducing costs, improved effectiveness and competitiveness among the small businesses, as well as providing a global talent pool (Edvardsson & Teitsdóttir, 2015:30).

Not only is there pressure on SMEs to create jobs, but there is pressure to also survive in the long run, and in order to achieve this in a highly competitive market they need to differentiate themselves from the competition. One such method is by means of service quality. SMEs are consequently under pressure in terms of service quality to generate a competitive advantage (Ebrahim, Ahmed & Taha, 2010:916; Anuar & Yusuff, 2011: 324). In the subsequent section customer expectations are discussed.

3 Customer expectations

Customers have certain expectations of the product or service they wish to purchase and these expectations are a personal vision of the outcome of the experience which could either be positive or negative (Machado, 2014:12). Or more plainly put, customer expectations are the wants and needs of customers (Berndt & Tait, 2014:51). Customer expectations are defined as guidelines for product evaluations, brand evaluation standards, or for comparison to a subsequent purchase experience (Jumat, Coffey & Skitmore, 2012:149). An expectation of a product is similar in that a customer expects certain attributes to exist in that product, whereas a service is foremost a service environment where customer and service provider interact, thus there are variations in customers' expectations of the service encounter (Strombeck & Shu, 2014:162). Comprehensive descriptions of the service quality concept are discussed in the following section.

4 Service quality

Service quality is an assessment of how well a service conforms to the customer's expectations in addition to continuously assessing the service provided to ensure that service standards are upheld and improved where necessary (Businessdictionary.com). Service quality is the discrepancy between the customers' perceptions of a service offered by a business and the customers' expectations of that business offering that particular service (Badruldin, Mohamed, Sharifuddin, Rezai, Abdullah, Latif & Mohayidin, 2012:61). Thus a gap can be identified as the difference between the expectations and performance (perceptions) of the actual service, which is a measure of customer satisfaction. If there is a large gap between perceptions and expectations then service quality is considered poor, whereas if the gap is small, then the service quality is considered to be high and in turn higher customer satisfaction is perceived. Customer satisfaction is measured by means of a service quality instrument which measures the quality of reliability, responsiveness, tangibles, assurance and empathy. Each dimension of service quality is described in the table below.

Service quality can be measured by means of the SERVQUAL model. Measurement of the perceptions and expectations are placed in a Likert scale which questions respondents' level of agreement and disagreement on the statements and an overall quality score can be calculated (Machado & Diggines, 2012:125). In spite of the widespread usage of the SERVQUAL model, there have been numerous criticisms on theoretical and procedural bases, however, the SERVQUAL model still maintains a powerful diagnostic authority and remains a convincing measurement of service quality (Owusu-Frimpong & Nwankwo, 2012:685).

Table 1. Service quality dimensions

Service quality dimension	Description
Tangibles	The extent to which physical attributes of the service such as the facilities and equipment are readably observable to the customers
Reliability	The ability to perform the promised service dependably
Responsiveness	The willingness to assist customers and provide prompt service
Assurance	The knowledge and courtesy and provision of prompt service
Empathy	The caring and individualised attention provided to customers

Source: Owusu-Frimpong and Nwankwo (2012:685) and Tseng and Wu (2014:84)

The adoption of service quality standards is determined by the commitment and management of SME leaders to service quality, which is dependent on the culture of the entrepreneur. As the culture of the SMEs is influenced by the culture of the entrepreneur, it in turn becomes the culture of the business (Bhaskaran, 2013:426). Perhaps, due to the level of difficulty in defining, measuring and controlling service quality because of its intangibility, heterogeneity and inseparability (Zhang, Xie & He, 2014:84), SMEs find it in certain instances difficult to establish service standards that are beyond the culture of the SME. Additionally, it is perhaps a lack of quality management that also contributes to the lack of quality standards. Quality management is defined as the management of activities and functions which include determining the quality policy and the implementation thereof through quality planning and quality assurance (Businessdictionary.com, 2014).

SME owners need to realise that customers' needs and wants should be identified and a service should be created which will satisfy the customer, and in order for customers to consider that it is not necessary to consider competing services (Machado & Diggines, 2012:120). Perceived quality is that which the customer experiences while utilising the service in question and it is suggested as an important factor of customers' satisfaction, which in turn affects a customer's intention to utilise that service (Zeithaml in Nekoei-Moghadam & Amiresmaili, 2011:58). In anticipating the customers' experiences and satisfaction, small businesses firstly have to benchmark what customer expectations are and from there improve their services based on the benchmark.

The Gaps model is based on the SERVQUAL model.

5 Gaps model

The SERVQUAL model evaluates customer satisfaction based on the service quality dimensions which are questions based on the perceptions and expectations of customers, and the difference in answers is an indication of customer satisfaction. The Gaps model identifies the gaps which cause problems in the service which has impacted the customer evaluations of service quality (Lamb, Hair & McDaniel, 2011:185). The Gaps model recognises that expectations of service are subjective, dynamic and unpredictable (Hernon & Altman, 2010:88). If poor service is experienced then it is an indication of a gap, which reflects as a negative number based on the equation below:

SERVQUAL Gap score = perception score – expectation score

A number of gaps arise from the model, which are discussed below (Machado & Diggines, 2012:128):

Gap 1: Knowledge gap is the difference in customer expectations and management's perceptions of what customers want.

Gap 2: Standards gap is the difference between management's perceptions of customer expectations and the service standards established.

Gap 3: Delivery gap is the difference between the set service standards and the actual service delivery.

Gap 4: Communication gap is the difference between the actual service delivered and that which was promised to the customers

Gap 5: Service gap is the difference between the customers' expectations and the perceived service.

As the study indicates, SME owners set the service quality standards of the business themselves, so if the owner does not have a clear understanding of what standard to set for the business, then it will operate according to the possibly inferior service standards that the owner sets. The purpose of the study is to establish whether SME owners in the major cities of South Africa have a clear understanding of service quality standards that need to be set and whether they actually provide the service according to those standards.

6 Research objectives

The main aim of the study is to establish SME owners' understanding of their expectations and perceptions of their service quality offering, which are indicative of service quality gaps that they should understand. The study therefore attempts to establish the extent of the standards gap which exists in the SME sector. From the literature review is becomes clear that there are misunderstandings in service quality standards. Based on the culture of the entrepreneur, the culture of the SME will align with the culture of the entrepreneur as it is the entrepreneur who sets the service standards.

7 Research methodology

A sample of small business owners was asked to complete a quantitative questionnaire designed to measure the different dimensions of service quality as

defined by the SERVQUAL model. That is, it was in order to determine whether a discrepancy (gap) exists between service quality items in their businesses that they feel all businesses should adhere to, and the extent to which they perceive their businesses to adhere to these items in South African SMEs. The questions were adapted to be general enough to accommodate businesses in any type of industry. The perspectives that were measured are the opinions of the SME owners regarding the importance of certain business items that influence service quality (their expectations), as well as their perceptions regarding how successful their businesses are in terms of adhering to these items. The questionnaire was administered to 120 business owners, all of whom provided responses to the questions measuring their importance rating of the different service quality items, and 94 useable responses were received.

8 Research findings

8.1 Expectations

The respondents were asked to indicate to what extent they agree that all businesses should adhere to a list of aspects (SERVQUAL) pertaining to service quality by selecting a score from a 5-point Likert scale (1=Strongly disagree; 2=Disagree; 3=Neutral; 4=Agree; 5=Strongly agree), with higher values being associated with a higher importance perception.

It is demonstrated in table 2 below that on average, the SME owners tend towards considering all the listed aspects of the five different dimensions to be important since the mean agreement score for practically all aspects is above the fourth (4) value in the 5-point rating scale. The only aspect rating that is just below 4, is in the tangibles dimension and refers to modern looking equipment. The standard deviation for this aspect is also the largest – an indication that the rating of this aspect resulted in the largest variation in opinions among the respondents. This difference in opinion is also demonstrated by the fact that those respondents who disagreed (16.3%, *n*=15) or felt neutral (15.2%, *n*=14) about it make up the largest proportions of such respondents across all aspects.

The aspect that was rated the most important on average concerns the reliability dimension and specifically the reliability aspect (*M*=4.624, *SD*=0.530), and the fact that even though the standard deviation is the smallest among all aspects, it is the aspect with the highest level of agreement regarding how important it is in a business. The second most important aspects based on the average agreement scores of the respondents are about aspects from the responsiveness and empathy dimensions. These aspects are about employees serving customers promptly (*M*=4.585, *SD*=0.663) and that customers will be given attention (*M*=4.585, *SD*=0.679). With their standard deviations also being at the lower end compared to the standard deviations of the other aspects, the respondents are also more in agreement about these aspects than about the others. Another aspect, although not one of the most important aspects according to the respondents on average, with a relatively high agreement in scores among the respondents, as indicated by the relatively small standard deviation, is about employees being neat in their appearance (*M*=4.419, *SD*=0.665) – an aspect of the tangibles dimension.

8.2 Perceptions

The respondents were asked to indicate to what extent they agree that their businesses adhere to the list of aspects pertaining to service quality by selecting a score from the same 5-point Likert scale that was used for the importance agreement ratings, with higher values being associated with a perception that their businesses adhere strongly to the service quality aspects.

It is clear from table 3 that on average, the SME owners tend to consider most of the listed aspects of the five different dimensions to be important since the mean agreement score for practically all aspects is above the fourth (4) value in the 5-point rating scale. The only aspects for which the adherence ratings are just below 4, refer to modern looking equipment and the physical facilities being visually appealing from the tangibles dimension and that employees must never be too busy to respond to customer requests in the responsiveness dimension. The standard deviations for these three aspects are also the largest (above 1) – an indication that the adherence ratings of these aspects demonstrate the largest variation in perceptions among the respondents.

The aspect that was rated the best adhered to on average in their own businesses, concerns the empathy dimension and specifically that they have their customers' best interests at heart (*M*=4.530, *SD*=0.570), and the fact that even though the standard deviation is the smallest among all aspects, it is the aspect with the highest level of agreement among respondents regarding how well it is adhered to in their businesses. The second most adhered to aspect based on the average adherence scores of the respondents is that their employees are always willing to help their customers (*M*=4.506, *SD*=0.697), which is an aspect in the responsiveness dimension. With its standard deviation also being at the lower end compared to the standard deviations of the other aspects, it indicates that the respondents are also more in agreement about this aspect than about most of the others. Another aspect, although not one of the most adhered to aspects according to the respondents on average, with a relatively high agreement in scores among the respondents, as indicated by the relatively small standard deviation, is about employees' ability to understand the needs of their customers (*M*=4.481, *SD*=0.596) – an aspect of the empathy dimension.

Table 2. Distribution statistics for the expectations rating scores

	Strongly disagree %(*n*)	Disagree %(*n*)	Neutral %(*n*)	Agree %(*n*)	Strongly agree %(*n*)	Total *N*	Mean(SD)
TANGIBLES							
Modern looking equipment	1.1(1)	16.3(15)	15.2(14)	39.1(36)	28.3(26)	92	3.772(1.070)
The physical facilities will be visually appealing	.0(0)	8.5(8)	13.8(13)	43.6(41)	34.0(32)	94	4.032(0.909)
Employees will be neat in their appearance	.0(0)	.0(0)	9.7(9)	38.7(36)	51.6(48)	93	4.419(0.665)
Materials linked with the service (pamphlets or statements) will be visually appealing	1.1(1)	2.1(2)	2.1(2)	43.6(41)	51.1(48)	94	4.415(0.739)
RELIABILITY							
Reliable	.0(0)	.0(0)	2.2(2)	33.3(31)	64.5(60)	93	4.624(0.530)
Show a sincere interest in solving customer issues	2.1(2)	1.1(1)	2.1(2)	28.7(27)	66.0(62)	94	4.553(0.784)
Perform the service right the first time	.0(0)	1.1(1)	3.2(3)	34.0(32)	61.7(58)	94	4.564(0.614)
Time management	1.1(1)	1.1(1)	1.1(1)	34.4(32)	62.4(58)	93	4.559(0.683)
Insist on error free records	.0(0)	5.4(5)	10.8(10)	36.6(34)	47.3(44)	93	4.258(0.859)
RESPONSIVENESS							
Employees will tell customers exactly when services will be performed	1.1(1)	4.3(4)	5.3(5)	36.2(34)	53.2(50)	94	4.362(0.853)
Employees will give prompt service to customers	.0(0)	3.2(3)	.0(0)	31.9(30)	64.9(61)	94	4.585(0.663)
Employees will always be willing to help customers	.0(0)	3.3(3)	2.2(2)	29.3(27)	65.2(60)	92	4.565(0.700)
Employees are never be too busy to respond to customers' requests	1.1(1)	8.6(8)	3.2(3)	30.1(28)	57.0(53)	93	4.333(0.971)
ASSURANCE							
The behaviour of employees will instil confidence in customers	.0(0)	2.1(2)	4.3(4)	33.0(31)	60.6(57)	94	4.521(0.684)
Customers will feel safe in transactions	.0(0)	2.1(2)	4.3(4)	36.2(34)	57.4(54)	94	4.489(0.684)
Employees will always be polite with customers	.0(0)	3.2(3)	4.3(4)	29.8(28)	62.8(59)	94	4.521(0.729)
Employees will have the knowledge to answer customers' questions	.0(0)	3.2(3)	6.4(6)	28.7(27)	61.7(58)	94	4.489(0.758)
EMPATHY							
Customers will be given attention	.0(0)	3.2(3)	1.1(1)	29.8(28)	66.0(62)	94	4.585(0.679)
Operating hours will be convenient to all customers	.0(0)	2.2(2)	10.8(10)	41.9(39)	45.2(42)	93	4.301(0.749)
Employees provide personal customers service	.0(0)	10.8(10)	5.4(5)	37.6(35)	46.2(43)	93	4.194(0.958)
Have their customers' best interest at heart	1.1(1)	4.3(4)	3.2(3)	33.3(31)	58.1(54)	93	4.430(0.839)
The employees will understand the specific needs of their customers	1.1(1)	2.2(2)	5.4(5)	35.5(33)	55.9(52)	93	4.430(0.786)

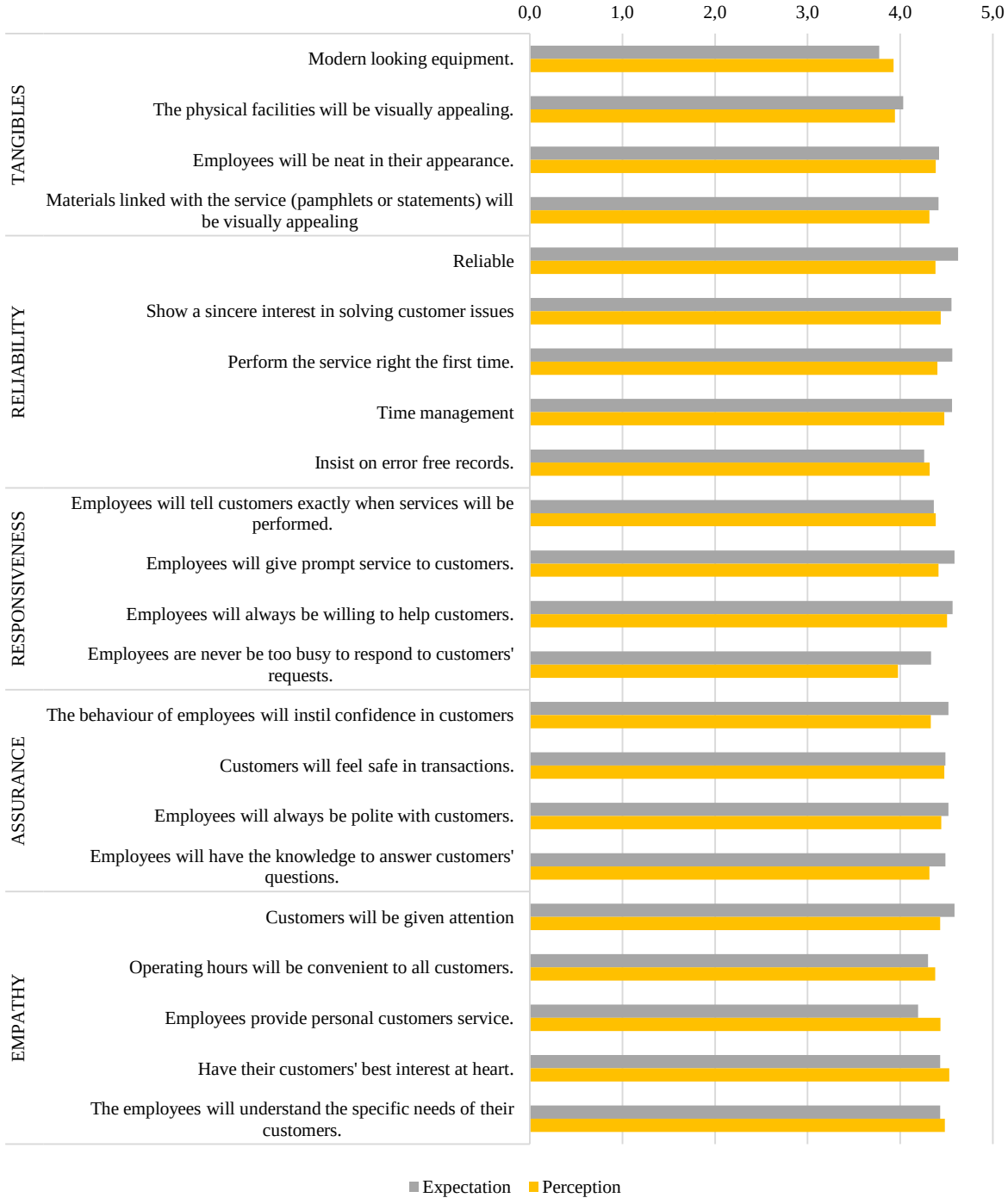
Table 3. Distribution statistics for the perceptions rating scores

	Strongly disagree %(*n*)	Disagree %(*n*)	Neutral %(*n*)	Agree %(*n*)	Strongly agree %(*n*)	Total *N*	Mean(SD)
TANGIBLES							
Modern looking equipment	2.4(2)	10.6(9)	9.4(8)	47.1(40)	30.6(26)	85	3.929(1.021)
The physical facilities will be visually appealing	3.4(3)	6.8(6)	14.8(13)	42.0(37)	33.0(29)	88	3.943(1.032)
Employees will be neat in their appearance	0.0(0)	1.2(1)	5.8(5)	46.5(40)	46.5(40)	86	4.384(0.654)
Materials linked with the service (pamphlets or statements) will be visually appealing	1.1(1)	3.4(3)	4.5(4)	44.9(40)	46.1(41)	89	4.315(0.806)
RELIABILITY							
Reliable	1.1(1)	0.0(0)	6.7(6)	43.8(39)	48.3(43)	89	4.382(0.715)
Show a sincere interest in solving customer issues	0.0(0)	3.4(3)	4.5(4)	37.1(33)	55.1(49)	89	4.438(0.738)
Perform the service right the first time	0.0(0)	1.1(1)	5.7(5)	44.8(39)	48.3(42)	87	4.402(0.655)
Time management	0.0(0)	0.0(0)	4.7(4)	43.0(37)	52.3(45)	86	4.477(0.589)
Insist on error free records	0.0(0)	4.7(4)	8.2(7)	37.6(32)	49.4(42)	85	4.318(0.820)
RESPONSIVENESS							
Employees will tell customers exactly when services will be performed	0.0(0)	3.5(3)	4.7(4)	41.9(36)	50.0(43)	86	4.384(0.738)
Employees will give prompt service to customers	0.0(0)	2.3(2)	3.4(3)	44.8(39)	49.4(43)	87	4.414(0.674)
Employees will always be willing to help customers	1.1(1)	0.0(0)	4.6(4)	35.6(31)	58.6(51)	87	4.506(0.697)
Employees are never be too busy to respond to customers' requests	2.4(2)	4.8(4)	22.6(19)	33.3(28)	36.9(31)	84	3.976(1.006)
ASSURANCE							
The behaviour of employees will instil confidence in customers	1.2(1)	2.4(2)	7.1(6)	41.2(35)	48.2(41)	85	4.329(0.808)
Customers will feel safe in transactions	0.0(0)	1.2(1)	3.5(3)	41.9(36)	53.5(46)	86	4.477(0.627)
Employees will always be polite with customers	0.0(0)	3.5(3)	3.5(3)	38.4(33)	54.7(47)	86	4.442(0.729)
Employees will have the knowledge to answer customers' questions	0.0(0)	1.2(1)	9.3(8)	46.5(40)	43.0(37)	86	4.314(0.690)
EMPATHY							
Customers will be given attention	0.0(0)	0.0(0)	5.8(5)	45.3(39)	48.8(42)	86	4.430(0.605)
Operating hours will be convenient to all customers	0.0(0)	2.4(2)	7.1(6)	41.2(35)	49.4(42)	85	4.376(0.723)
Employees provide personal customers service	0.0(0)	2.4(2)	4.8(4)	39.8(33)	53.0(44)	83	4.434(0.702)
Have their customers' best interests at heart	0.0(0)	0.0(0)	3.6(3)	39.8(33)	56.6(47)	83	4.530(0.570)
The employees will understand the specific needs of their customers	0.0(0)	0.0(0)	5.1(4)	41.8(33)	53.2(42)	79	4.481(0.596)

8.3 Expectations aspects compared to perceptions aspects on average

Since the importance of expectations and the adherence perceptions were rated on the same 5-point rating scale, it is possible to compare the mean agreement scores without having to standardise them. Figure 1 illustrates how these mean scores differ. For quite a number of different aspects within each of the service quality dimensions, the expectations exceed the adherence perceptions. However, it is also the case that in every dimension besides the assurance dimension, there are some aspects for which the average perceived adherence scores exceed that of the importance (expectations) scores.

Figure 1. Mean differences between expectation and perception scores



8.4 SERVQUAL gap analysis

In order to investigate the magnitude of these mean differences between the expectations scores and the perception scores as prescribed by the SERVQUAL model, the difference between the two mean scores was calculated for each respondent by using the following formula:

SERVQUAL: Gap score = perception score – expectation score

The Gap score is an indication of whether a discrepancy exists between items that the owners agree (or not) should be adhered to in any business and what their perceived adherence level is regarding these items in their own businesses. According to the SERVQUAL model, this calculated gap score is a measure of service quality – in this case as seen from the suppliers' perspective. Smaller gaps are associated with higher levels of service quality. A negative gap is an indication that the perceived quality of the service is at a lower level than what is expected, while a

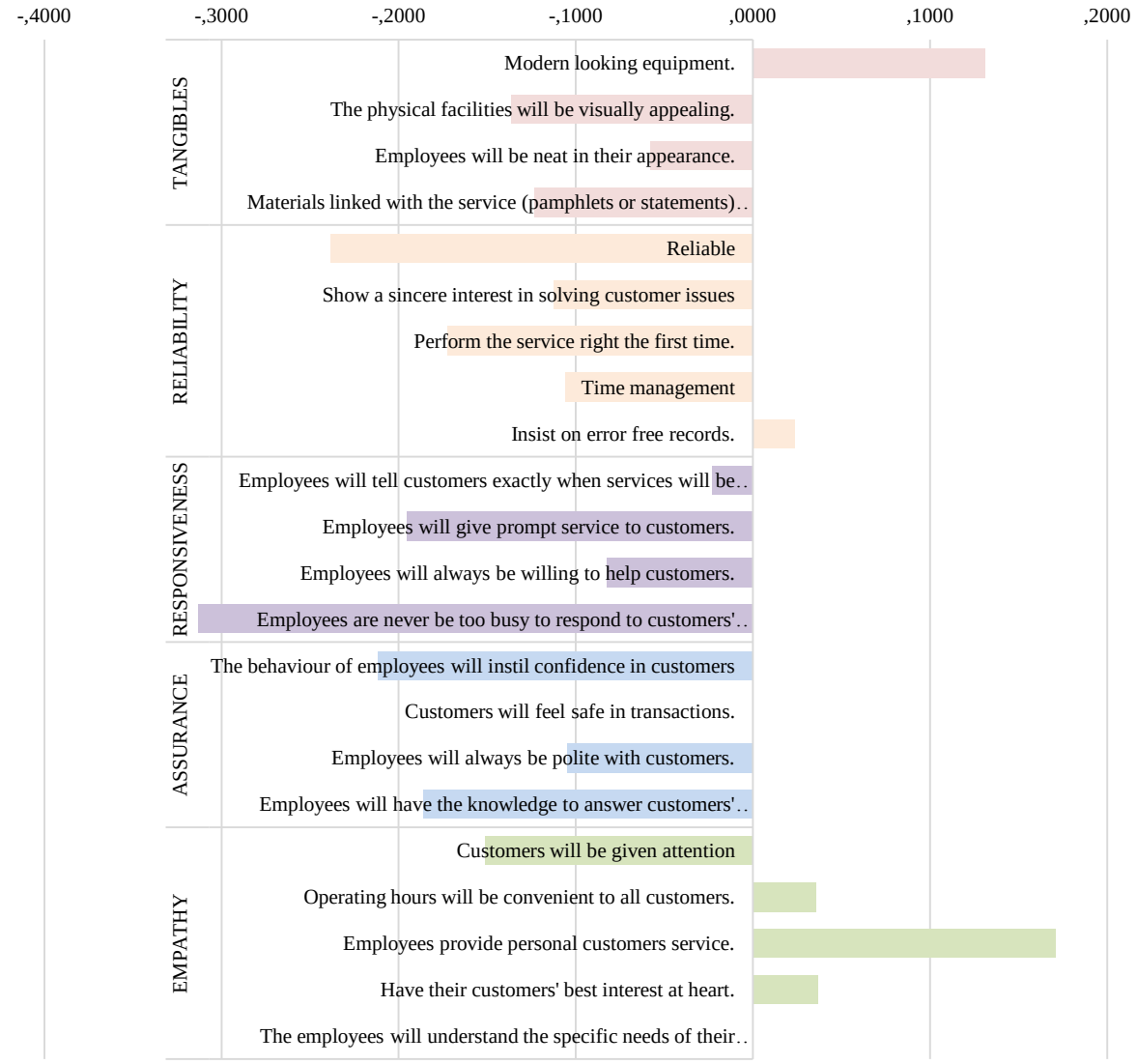
positive gap is an indication that the perceived quality of the service is better than what is expected. A gap of zero is an indication that the service is performed at the expected level of quality. Thus, in an effort to improve the quality of service delivery, a business needs to attend to items that result in negative gaps.

Figure 2 shows that the gaps are mostly negative, implying that it is the opinion of the owners that their businesses should improve in a lot of areas. In the case of five items, the gaps are positive and in the case of another two, the gaps are zero, indicating that the owners do have some positive feelings about what is happening in their businesses regarding service quality.

In figure 2 it is obvious that the largest gap is for an aspect in the responsiveness dimension and it pertains to employees who are never too busy to attend to customers' requests. The gap is negative, indicating that although the owners consider this aspect as important for all businesses to adhere to, adherence to this aspect in their own businesses, as they perceive it, is the least up to standard of all the items.It is interesting that in the case of reliability, it was the one aspect that, on average, had the smallest variation in responses among the respondents and was also the most important aspect according to the respondents, while it produced the second largest negative gap (figure 2).

The largest positive gap is in the tangibles dimension regarding modern looking equipment. This aspect was rated the least important (lowest expectation) on average and could explain why the owners feel that the equipment they have is adequate or better than expected. Other positive gaps are mostly in the empathy dimension which creates the impression that the owners have a positive regard for their employees' ability to empathise with their customers.

Figure 2. Mean gap scores



9 Conclusion and recommendations

Service quality describes at what level of quality a service is delivered to the customers and how it is refined to continuously meet customers' expectations (American Marketing Association, 2014). SMEs should strive to perform better with their knowledge processing and shift from being product oriented to customer oriented (Tseng & Wu, 2014:78). In addition, Owusu-Frimpong and Nwankwo (2013:693) identified that SMEs should train their employees on providing improved service quality. Although products produced especially in Africa are considered to be of poor quality, there is a possible opposite outcome for SMEs if the owners of SMEs come to understand service quality, which is driven by policy support, and provide that quality service to customers if SMEs design ways to perceive, think and feel in relation to quality management. In gearing employees within a business towards a customer-oriented environment, the likelihood of providing high service quality increases.

As service quality is a cornerstone of economic growth objectives and profitability (Owusu-Frimpong & Nwankwo, 2013:694), it is not enough for SMEs to only understand what service quality standards entail, but also to understand how to perform high service quality.

This study revealed that in the businesses of South African SMEs, there exist discrepancies (gaps) between items that the owners feel should be adhered to and the extent to which they perceive their businesses to adhere to these items. It would therefore be useful for South African SMEs to employ the SERVQUAL measurement tool to uncover items in their businesses that need to be addressed in terms of improving their quality of service.

It is recommended that to close the gaps between perception of service quality provided and the actual service provided, it is necessary for SMEs to look at solutions such as: (Machado & Diggines, 2012:128, Tseng & Wu, 2014:88):

- showing greater commitment to developing standards,
- integrating more customer centric processes,
- providing clearer guidelines to customer-contact staff to deliver a service that is according to set standards,
- establishing clear roles for staff in delivering quality service, and
- emphasising first line sales training so that sales staff are equipped with excellent communication skills and service knowledge.

In order to apply the solutions as suggested, it is recommended that training programmes developed that focus on SMEs be implemented. Institutions of higher learning can embark on rolling out and offering short courses to transfer skills and develop SMEs as part of their community involvement programmes.

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FUEL PRICE AND EXCHANGE RATE DYNAMICS IN SOUTH AFRICA: A TIME SERIES ANALYSIS

Ferdinand Niyimbanira*

Abstract

This paper empirically examined the relationship between fuel price and exchange rate in South Africa. Monthly data spanning over the period of January 2001 to December 2013 was used while adopting the cointegration method. The Augumented Dickey Fuller (ADF) test showed that all variables (Fuel Price, Exchange rate and New Vehicle sales) became stationary after the first difference**.** The results from Johansen cointegration test indicated no cointegrating equation, indicating that series were not cointegrated.The findings show that fuel price is affected by at least its two previous month prices. Both explanatory variable coefficients (0.541228 and -0.368649), show that fuel price will be increased by 20 cents Rand due to its previous two month prices. The results from impulsive test confirmed VAR test results. This paper provided evidence that there was a causal link from the exchange rates to petrol price during last one sub-period. The implication therefore is that in South Africa an increase of the fuel price is a response to the Rand value fluctuations ceteris paribus. Based on the findings of the study, policy implications and suggestion for future research are made.

Keywords: Fuel Price, Exchange Rate, Cointegration, Vector Autoregressive (VAR), South Africa

JEL Classification: F30, F31, C22, Q43

***** *Vaal University of Technology, Office E005/2, Andries Potgieter BLVD, Vanderbijlpark, 1911, South Africa*
Tel: +27 16 950 9194

1 Introduction

There is a growing consensus that global crude oil price fluctuations are mainly driven by changes in the demand for oil and fuel price being above US$100/bbl has become regular news (KPMG, 2008). Exchange rates have been thought to have a significant impact on the export and import of goods and services. Consequently, influencing the price of those products that are traded (Harri, Nalley & Hudson, 2009). Since petrol price and exchange rates both have been experiencing fluctuations, their relationship has attracted considerable interest from many economists globally.The impact of exchange rates in local economies is often not widely publicised. Nevertheless, Gill Marcus, the former South African Reserve Bank Governor, observed that the weak Rand (South African currency) exchange rate affected the petrol price. In December 2013 and January 2014 the Rand depreciation cumulatevely led to an increase of 55 cents per litre. A further increase in petrol price of 30 cents per litre prevailed in February 2014 due to weak exchange rate (Enca, 2014). Therefore, there is a link between fuel price and exchange rates. Unfortunately this link is hardly articulated by academics, especially in South Africa.

Globally, the changes in the price of crude oil between 1997 and 2011 have been difficult to explain with only fundamentals related to the supply/demand balance. But the change in the global-US dollar exchange rate over the last decade has had significant implications for local, as well as global companies and the South Africa economy. Being an oil importing country, South Africa needs to examine the existence of a link between fuel price and exchange rate. Though this link is generally recognised through medea, not enough research has been empirically conducted to explicitly bring this relationship to the fore in South Africa.

The present study aims at investigating the relationship between fuel price and exchange rate in South Africa. The study is organised as follows: section one gives the introduction. This is followed by a review of some empirical studies in section two. Data sources and the econometric model are discussed in section 3. Whilst section 4 focuses on the methodology used, section 5 discusses the results and findings. Lastly the sixth section concludes the whole research.

2 Review of some empirical studies

Several studies designed to determine the relationship between fuel price and exchange rate have been conducted by many macroeconomists nationally and internationally. These studies have been discerned by

the different sample sizes, time when conducted, variables used and the different settings and contexts in which they were conducted. This section explores a few of these studies.

The spillover effect of the USA dollar exchange rate on oil prices was studied by Zhang, Fan, Tsai and Wei (2008) using econometrics models that included cointegration, VAR, ARCH type. The newly proposed approach then to test Granger causality in risk exploring mean spillover, volatility spillover and risk spillover was also used. A significant long-term equilibrium cointegrating relationship between the two markets was indentified. In addition they found that apparent volatility and clustering for the two market prices existed, though their volatility spillover effect was not significant. It was also established that the instant fluctuation in US dollar exchange rate did not cause significant change in the fuel market.

Like any other countries, China is not different: the issue of linkage between oil shocks and the real exchange rates has become a perennial source for concern of investigation. This is because the country's recent advent of its more flexible exchange rate system. Huang and Guo (2006) investigated the extent to which the oil price shock and three other types of underlying macroeconomic shocks impacted the trend movements of China's real exchange rate. Using the VAR model, the study established that real fuel price shocks led to a minor appreciation of the long-term real exchange rate since China depended less on imported fuel than its trading partners.

Trying to fill the existing gap in the literature, Yousefi and Wirjanto (2004) brought together the insights on exchange rate pass through and oil market structure models. The study adopted a novel empirical approach to the crude-oil price formation for the purpose of highlighting the price reactions of OPEC member countries to changes in the exchange rate of the USA dollar against other major currencies and prices of other members.

Using Vector Autoregressive (VAR) modelling and cointegration techniques, Rautava (2004) analysed the impact of international oil prices and the real exchange rate on the Russian economy and its fiscal policy. The results indicated that the "Russian economy is influenced significantly by fluctuations in oil prices and the real exchange rate through both long-run equilibrium conditions and short-run direct impacts" (Rautava, 2004:315).

With usage of Engle-Granger and causality tests, Chaudhuri and Daniel (1998) demonstrated that the nonstationary behaviour of US dollar real exchange rates, over the post-Bretton Woods era, was caused by the nonstationary behaviour of real oil prices. They used data set of real exchange rates for 16 OECD countries and for real oil prices. Monthly data were from 1973:01-1996:02 for all countries except Italy and Switzerland where samples ended in 1993:11, and Belgium where the sample was from 1980:01-1996:03.

Amano and Norden (1998) examined the issue of the relative importance of real versus monetary shocks in explaining exchange rate movements. In other words, they investigated oil prices and the rise and fall of the US real exchange rate. They found that a stable link exists between oil price shocks and the US real effective exchange rate over the post-Bretton Woods period. They suggested that oil prices may have been the dominant source of persistent real exchange rate shocks and that energy prices may have important implications for future work on exchange rate behaviour (Amano & Norden, 1998:299).

Using monthly panel data from G7 countries with a sample size of 394, Chen and Chen (2006) investigated the long-run relationship between real oil prices and real exchange rates. The results show that real oil prices may have the dominant source of real exchange rate movements. This implies the existence of a link between the two variables. In addition, the findings of the papep from panel predictive regression suggested that real oil prices had significant forecasting power.

3 Data source and econometric model

The current study focuses on the relationship between fuel price and exchange rate in South Africa. Also includes new vehicle sale index in the model. Therefore, the following are the mathematical (1) and econometric (2) models used in this paper:

$$FP = f(EXR, NVS) \tag{1}$$

$$FP_t = \alpha + \beta_1 EXR_t + \beta_2 NVS_t + \mu_t \tag{2}$$

3.1 Dependant variable

FP = fuel price per little in Rand (South African currency)

3.2 Explanatory variables

EXR = Real exchange rate
NVS = New vehicle sale Index
α = Intercept
β's = Slope coefficients
μ = Error term

The contemporary examination uses secondary monthly time series data for the period from January 2001 to December 2013. The fuel price data were obtained from Statistics South Africa, exchange rate data was obtained from South African Reserve Bank while new vehicle sale index was gathered from easydata.com website.

4 Methodological discussion

The vector autoregressive (VAR) model is one of the most successful, flexible, and easy to use for the analysis of multivariate time series. It is a natural

extension of the univariate autoregressive model to dynamic multivariate time series. The VAR model has proven to be especially useful for describing the dynamic behaviour of economic and financial time series and for forecasting. It often provides superior forecasts to those from univariate time series models and elaborate theory-based simultaneous equations models. Forecasts from VAR models are quite flexible because they can be made conditional on the potential future paths of specified variables in the model. Below, is the VAR model used in this paper:

$$FP_t = \alpha_1 + \sum_{J=1}^{K} \beta_{1j} FP_{t-j} + \sum_{j=1}^{k} \lambda_{1j} EXR_{t-j} + \sum_{j=1}^{k} \gamma_{1j} NVS_{t-j} + \varepsilon_{1t} \quad (3)$$

$$EXR_t = \alpha_2 + \sum_{J=1}^{K} \beta_{2j} FP_{t-j} + \sum_{j=1}^{k} \lambda_{2j} EXR_{t-j} + \sum_{j=1}^{k} \gamma_{2j} NVS_{t-j} + \varepsilon_{2t} \quad (4)$$

$$NVS_t = \alpha_3 + \sum_{J=1}^{K} \beta_{3j} FP_{t-j} + \sum_{j=1}^{k} \lambda_{3j} EXR_{t-j} + \sum_{j=1}^{k} \gamma_{3j} NVS_{t-j} + \varepsilon_{3t} \quad (5)$$

Where α is the intercept; β, λ and γ, are the coefficients; k is number of lags and ε's are the stochastic error terms (known as shocks in a VAR model). Before estimating the above equations, the Augmented Dickey Fuller (ADF) test was used to test for the unit root in the variables. If the variables have a unit root, a cointegration test is generally undertaken to establish whether nonstationary variables move together over time and have a linear combination (Brooks, 2008).When are I(1), such variables are said to be cointegrated if a linear combination of them can be stationary (Brooks, 2002:388). This implies that two nonstationary series may be bound by some relationship in long run (Niyimbanira, 2013). The cointegrating relationship is, therefore, considered as a long run or equilibrium phenomenon of variables that might deviate from short run relationship (or may have no tendency to move together) but return their association in the long run (Patterson, 2000:15). This research uses the Johansen's cointegration test to identify whether trends in fuel price and real exchange rate that contain a unit root have a long run relationship in South Africa. The Johansen's (1988 and 1991) multivariate cointegrating Vector Autoregressive (VAR) approach is discussed by Brooks (2002); Charemza and Deadman (1993 & 1997) and Enders (2004) as follows:

Considering unrestricted VAR model:

$$Zt = \sum_{i=1}^{k} A_i Z_{t-i} + \varepsilon_t \quad (6)$$

Where: $Z_t = \begin{bmatrix} FP_t \\ EXR_t \\ NVS_t \end{bmatrix}$ is column vector of observations on fuel price, real exchange rate and new vehicle sale index; and, ε_t = a column vector of Random errors which are usually assumed to be contemporaneously correlated but not autocorrelated. Assuming that all variables are cointegrated in the same order, the VAR model (6) can be presented as follows:

$$\Delta Z_t = \Pi Z_{t-k} + \sum_{i=1}^{k-1} \Gamma_i \Delta Z_{t-i} + \varepsilon_t, \text{ for } k \geq 2 \quad (7)$$

Where: $\Pi = -(I - A_1 - A_2 - \ldots A_k)$; and, $\Gamma_i = -(A_{i+1} + A_{i+2} + \ldots + A_k)$, $i = 1,\ldots,k-1$

That is:

$\Gamma_1 = -(A_2 + A_3 + \ldots A_k)$;

$\Gamma_2 = -(A_3 + \ldots A_k)$;

$\Gamma_{k-1} = -A_k$.

According to Charemza and Deadman (1997:172), the matrix Π represents constant dynamic adjustments of first difference of variables respectively to the levels, regardless of time difference. Thus, using the three variables (fuel price, exchange rate and new vehicle sale index) of the VAR model of this paper, the decomposition of matrices ΠZ_{t-1} (or ΠZ_{t-k}) is as follows:

$$\begin{bmatrix} FP_t \\ EXR_t \\ NVS_t \end{bmatrix} = A_1 \begin{bmatrix} FP_{t-1} \\ EXR_{t-1} \\ NVS_{t-1} \end{bmatrix} + A_2 \begin{bmatrix} FP_{t-2} \\ EXR_{t-2} \\ NVS_{t-2} \end{bmatrix} + \ldots + A_k \begin{bmatrix} FP_{t-k} \\ EXR_{t-k} \\ NVS_{t-k} \end{bmatrix} + \begin{bmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \\ \varepsilon_{3t} \end{bmatrix} \quad (8)$$

Using the transformation shown in Equation (7), this can be presented as:

$$\begin{bmatrix}\Delta FP_t\\ \Delta EXR_t\\ \Delta NVS_t\end{bmatrix} = \Pi\begin{bmatrix}FP_{t-1}\\ EXR_{t-1}\\ NVS_{t-1}\end{bmatrix} + \Gamma_1\begin{bmatrix}\Delta FP_{t-1}\\ \Delta EXR_{t-1}\\ \Delta NVS_{t-1}\end{bmatrix} + \ldots + \Gamma_{k-1}\begin{bmatrix}\Delta FP_{t-k+1}\\ \Delta EXR_{t-k+1}\\ \Delta NVS_{t-k+1}\end{bmatrix} + \begin{bmatrix}\varepsilon_{1t}\\ \varepsilon_{2t}\\ \varepsilon_{3t}\end{bmatrix} \quad (9)$$

According to Johansen and Juselius (1990), the matrix Π (whose dimension is a 3 by 3 in this case), can be expressed as a product of two matrices:

$$\Pi = \alpha\beta' \text{ (where } \alpha \text{ and } \beta' \text{ are both the same since } \Pi \text{ is a square matrix).} \quad (10)$$

The matrix β' gives the cointegrating vectors (a matrix of long run coefficients), while α stand for the adjustment of parameters that shows the level of speed with which the system responds to last period's deviations from the equilibrium (Brooks, 2002:406). Therefore, Johansen test is based on the examination of the Π matrix which can be interpreted as long-run coefficient matrix, since in equilibrium, all the ΔY_{t-i} will be zero and setting the error terms (u_t) to their expected value of zero will leave $\Pi Y_{t-k} = 0$. Hence, the test for cointegration between FP, EXR and NVS is calculated by looking at the rank (r) of the Π matrix with the use of its eigenvalues. Since the matrix has two columns, its maximum rank is 2 and its minimum rank is zero. But, for the matrix Π to have a rank of 1, the largest eigenvalue must be significantly non-zero, while others will not be significantly different from zero. It should be noted that in case there is no cointegrating equation found the Vector Error correction model wouldn't be estimated. However, if the cointegration test indicates that variables are not co-integrated, then the VAR model will be the one to be used. Thus, the following equations would be used but without error correction term:

$$\Delta PF_t = \alpha_1 + \sum_{J=1}^{K}\beta_{1j}\Delta FP_{t-j} + \sum_{j=1}^{k}\lambda_{1j}\Delta EXR_{t-j} + \sum_{j=1}^{k}\gamma_{1j}\Delta NVS_{t-j} + \Psi_1 u_{2t-1} + \varepsilon_{1t} \quad (11)$$

$$\Delta EXR_t = \alpha_2 + \sum_{J=1}^{K}\beta_{2j}\Delta FP_{t-j} + \sum_{j=1}^{k}\lambda_{2j}\Delta EXR_{t-j} + \sum_{j=1}^{k}\gamma_{2j}\Delta NVS_{t-j} + \psi_2 u_{2t-1} + \varepsilon_{2t} \quad (12)$$

$$\Delta NVS_t = \alpha_3 + \sum_{J=1}^{K}\beta_{3j}\Delta FP_{t-j} + \sum_{j=1}^{k}\lambda_{3j}\Delta EXR_{t-j} + \sum_{j=1}^{k}\gamma_{3j}\Delta NVS_{t-j} + \psi_3 u_{3t-1} + \varepsilon_{3t} \quad (13)$$

Where Δ is the first difference operator, $u_{1t-1\ldots}u_{3t-1}$ are error correction terms and $\psi_{1\ldots7}$ are error correction coefficients. These error correction coefficients are expected to capture the adjustments of change in the variables towards long-run equilibrium, while the coefficients, β, λ and γ, are expected to capture the short-run dynamics of the model (Muzindutsi and Sekhampu, 2013).

5 Discussion of results and findings

According to Niyimbanira (2013) as in any time series analysis, it is a good idea to plot the observed values of the data series over time in order to have an idea whether the given data is a stationary or not. This is also confirmed by Gujarati and Porter (2009) who posit that before one pursues formal tests, it is always advisable to plot the time series under investigation graphically. Such plots provide an initial clue about the likely nature of the time series. The advantage is that a visual display helps to present information of a dataset in a summarised and informative way. The following are the individual plots of the data this paper uses.

FP is trending upwards. This suggests that its mean is changing. It may show that FP is not stationary. Figure 2 and 3 (average real exchange rate and new vehicle sales index) might represent a Random walk series which shows a definite trend. Gujarati (2003:807) suggests that the above realisations are the starting point of any analysis when one uses time series. But between 2006 and 2009 all the three variables commonly indicate trending downwards which may be due to global economic crisis faced. This has effects because the currencies of African countries got weaken in a generalized fashion vis-à-vis the U.S. dollar at the onset of the global economic crisis (Ltaifa *et al*, 2009).

Figure 1. Fuel price

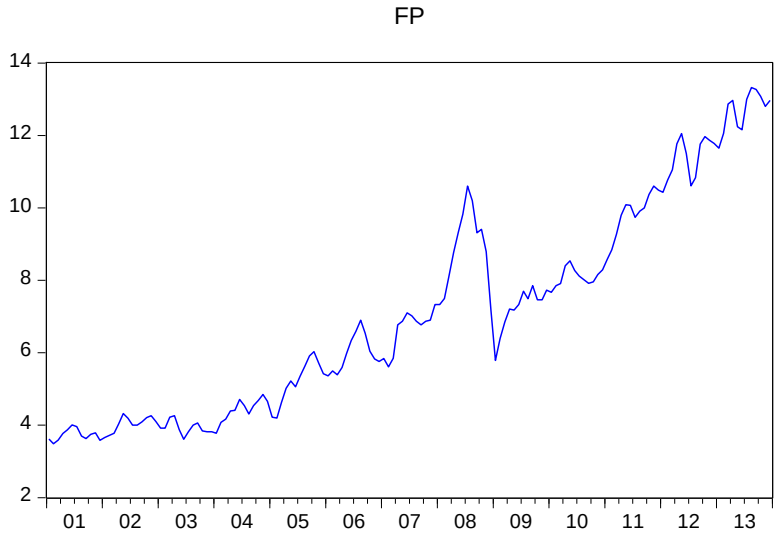


Figure 2. Average real exchange rate

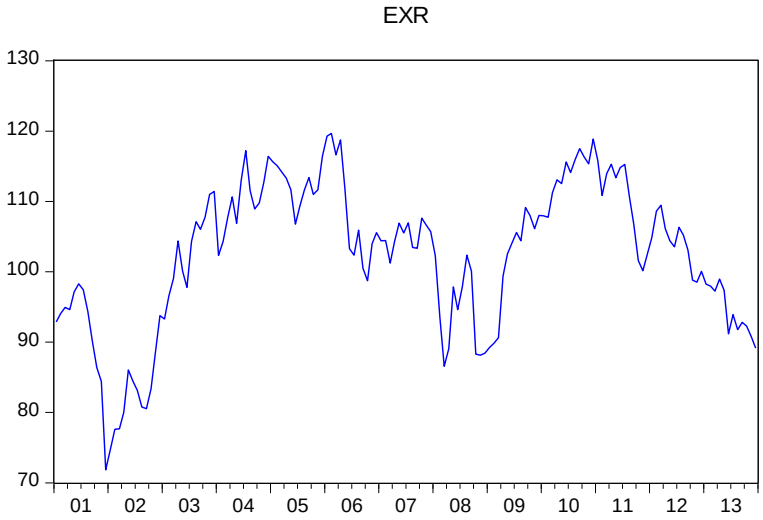
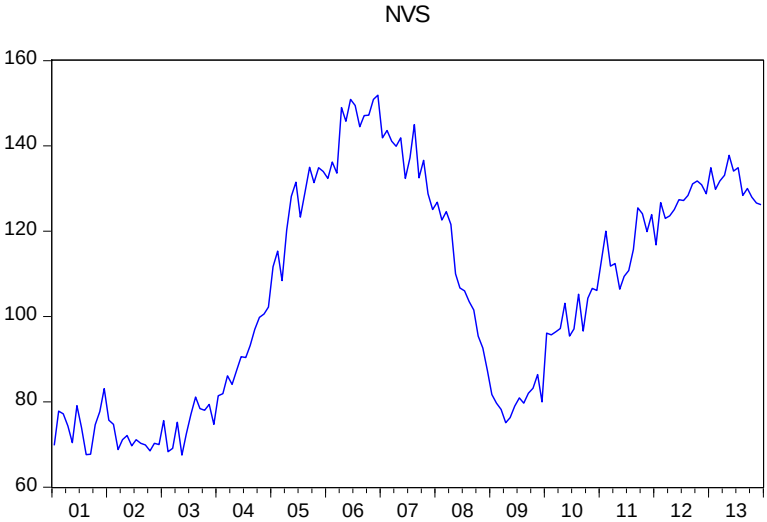


Figure 3. New vehicle sales



Secondary, all variables were tested for stationarity using ADF and the results showed that all variables become stationary after the first difference. This means that FP, EXR and NVS were integrated of order one, I(1). It should be noted that the shocks to these I(1) series have permanent effects; the reason why it is important to have a formal test for a unit root. As general rule, nonstationary time variables must not be used in a regression model, in order to avoid the problem of spurious regression (Niyimbanira, 2012 & 2013). However it should be indicated that in a case where two or more variables share similar stochastic trends, they are said to be cointegrated if a linear combination of them is stationary. In addition, the lag length was determined, using the lag length selection criteria of Akaike, Schwarz and Hannan-Quinn information criteria. A lag of 2 was selected based on the criterion with the lowest value which is the Hannan-Quinn information criteria; this is shown in table 1. Although lag of 2 was chosen, we run the data using lag of 8 given by LR, FPE and AIC and results were different from the theory, the reason why lag of 2 was chosen.

Table 1. VAR lag order selection criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-871.572	NA	41.1878	12.2318	12.2949*	12.2570
1	-851.447	39.1245	35.2543	12.0762	12.3248	12.1772
2	-832.275	36.4662	30.5853	11.9339	12.3690	**12.1107***
3	-823.544	16.2410	30.7144	11.9377	12.5593	12.1903
4	-818.359	9.42663	32.4246	11.9911	12.7991	12.3194
5	-806.526	21.0183	31.2059	11.9514	12.9459	12.3555
6	-796.682	17.0720	30.8989	11.9396	13.1206	12.4195
7	-790.978	9.65259	32.4425	11.9857	13.3532	12.5414
8	-763.424	45.4742*	25.1151*	11.7262*	13.2802	12.3577
9	-760.289	5.04328	27.3843	11.8082	13.5486	12.5155
10	-754.266	9.43327	28.7092	11.8499	13.7768	12.6329
11	-751.181	4.70334	31.3999	11.9326	14.0459	12.7914
12	-741.920	13.7294	31.5455	11.9289	14.2288	12.8635

Note: *indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Given that all variables are I(1), the next step in the analysis is to test for cointegration by forming a potentially cointegrating regression and testing its residuals for non-stationarity (Brooks, 2002). In this case the Johansen system procedure was used for cointegration which tests the existence of long-run relationship between the series. The results from Johansen test are presented in table 2.a (Unrestricted Cointegration Rank Test (Trace)) and 2.b. (Unrestricted Cointegration Rank Test (Maximum Eigenvalue). The results reveal that trace statistics (in 2.a) and max-Eigen Statistics (in 2.b) are all smaller than the critical value; meaning that, based on study by Mills and Mills (1991), the series are not cointegrated. Consequently, the null hypothesis of no cointegrating vectors (none) cannot be rejected. This also means that all other null hypothesizes cannot be rejected. Given that there are no linear combinations of the variables are stationary, this means that there is no error correction representation (Brook, 2002).

Although there is no direct interpretation for the coefficients in the VAR estimates, the relationship depicted as well as the levels of significance are still important. As indicated in the section of methodology, if variables are I(1) equations 11, 12 and 13 were used for VAR. The results from the VAR are shown in table 3. Findings show that fuel price is affected by at least its two previous month prices. This is explained by (D(FP(-1) and D(FP(-2) coefficients which are statistically significant were their t values are 7.11150 and 4.85831. In other words looking at both coefficients (0.541228 and -0.368649), one may conclude that fuel price will be increased by 20 cents due its previous two month prices. In term of how exchange rate influence FP, both D(EXR(-1)) and D(EXR(-2)) coefficients are statistically significant where their t values are -2.20919 and 2.44657 respectively. This implies that the previous month exchange rate have a negative effect on this month fuel price while the second previous month have a positive one. Furthermore, the negative signs of exchange rates coefficients show that the depreciation of Rand increases fuel price; meaning there is a negative relationship between exchange rates and

petrol price in South Africa. This is in line with Yousefi and Wirjanto (2004) who provided evidence that a depreciation of the dollar triggers an increase in the price of oil. In addition, the results indicate that new vehicle sales of a both two previous months do not have any effect on fuel price. This is confirmed by the statistical insignificance of their t values: 0.40823 and 0.98340.

Table 2. Johansen test results

2.a. Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None	0.107623	23.26012	29.79707	0.2335
At most 1	0.037171	6.066350	15.49471	0.6877
At most 2	0.002293	0.346610	3.841466	0.5560

Note: Trace test indicates no cointegration at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

2.b. Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.107623	17.19377	21.13162	0.1630
At most 1	0.037171	5.719739	14.26460	0.6494
At most 2	0.002293	0.346610	3.841466	0.5560

Note: Max-eigenvalue test indicates no cointegration at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

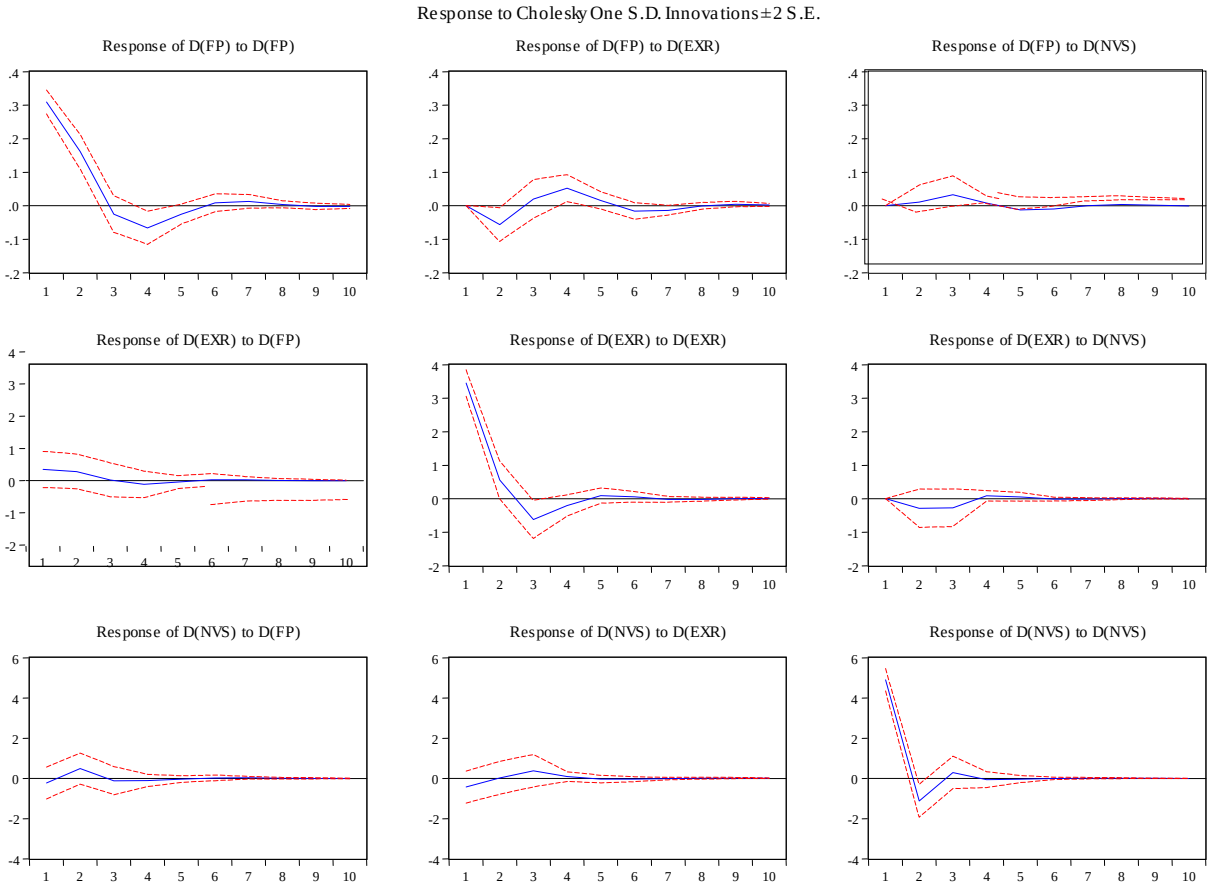
From table 3, looking on the results in first column, this study provides evidence that there is a causal link from the exchange rates to petrol price during last one sub-period. Understandably, South Africa as a petrol importing country this means that an increase of the fuel price is a response from Rand depreciation. This is in line with other studies which also concluded that the causality mainly runs from exchange rates to oil prices (Cheng, 2008) and (Yousefi & Wirjanto, 2004).

Table 3. Result of the VAR estimates: FP, EXR, and NVS (2001-2013)

	D(FP)	D(EXR)	D(NVS)
D(FP(-1))	0.541228	0.687775	1.418895
	(0.07611)	(0.85335)	(1.21155)
	[7.11150]	[0.80597]	[1.17114]
D(FP(-2))	-0.368649	-0.174124	-0.904333
	(0.07588)	(0.85081)	(1.20796)
	[-4.85831]	[-0.20466]	[-0.74865]
D(EXR(-1))	-0.016049	0.154869	-0.022188
	(0.00726)	(0.08146)	(0.11565)
	[-2.20919]	[1.90122]	[-0.19185]
D(EXR(-2))	0.017892	-0.199643	0.136620
	(0.00731)	(0.08200)	(0.11642)
D(NVS(-1))	0.002121	-0.058335	-0.228269
	(0.00520)	(0.05827)	(0.08272)
	[0.40823]	[-1.00117]	[-2.75939]
D(NVS(-2))	0.005071	-0.061106	0.003191
	(0.00516)	(0.05782)	(0.08209)
	[0.98340]	[-1.05690]	[0.03887]
C	0.048291	-0.024636	0.361495
R-squared	0.297142	0.077461	0.067656
Adj. R-squared	0.268257	0.039549	0.029340
Sum sq. resids	13.99766	1759.829	3547.335
S.E. equation	0.309636	3.471833	4.929180
F-statistic	10.28721	2.043155	1.765747
Log likelihood	-34.14419	-403.9514	-457.5764

It is commonly known in econometrics that a shock of one variable does not only directly affects itself but is also transmitted to all of the other endogenous variables through the dynamic (lag) structure of the VAR. Therefore, an impulsive response function traces the effects of a one-time shock to one of explanatory variables on current and future values of the endogenous variables. In this case, the results from impulsive test confirm what was said above from VAR test results. In other words, figure 4 is about the impulse responses of the fuel price which are consistent with economic reasoning. Regarding response to D(FP) results on figure 4, especially the first on second row, a shock in exchange rate largely depicts a positive effect on fuel price. Given a one standard deviation shock in exchange rate, fuel price will increase from the first period all the way to the sixth period and it will be stable between period five and period ten. This means that even if we could use 3 or 4 lags it was going to show that fuel prices are affected mostly by exchange rate of previous month.

Figure 4. Impulse Response Functions: FP, EXR and NVS (2001-2013)



6 Conclusion

As an open and middle income country, South Africa considers exchange rate as a key macroeconomic policy instrument that ensures export promotion and economic growth. Using the cointegration method, this paper empirically investigated the relationship between fuel prices and exchange rates in South Africa. All variables were tested for stationarity using ADF and the results showed that all variables become stationary after the first difference. This means that FP, EXR and NVS were integrated of order one, I(1) meaning that the shocks to these I(1) series have permanent effects, the reason why it is important to have a formal test for a unit root. The link between oil prices and US dollar exchange rates has been frequently analysed and popular findings are that the real exchange rates and real oil prices are cointegrated. The results in this study indicate that exchange rates and petrol prices are not cointegrated. However, the results from VAR indicate that the previous month exchange rate have a negative effect on the current month's fuel price while the second previous month have a positive one. Furthermore, the negative signs of exchange rates coefficients show that the depreciation of Rand increases fuel price; meaning there is a negative relationship between exchange rates and petrol price in South Africa. Policy makers should keep in mind that whenever attempting to control exchange rate they should look

on how it may affect petrol price. Though, many of the policies that can address the impact of rising petrol prices on consumers are long-term in nature, this study suggests that short–term exchange rate policy would be more effective than long-term with regard to petrol price in South Africa. For future research, this paper suggests the usage of nominal exchange rate and other macroeconomic variables to investigate how they affect petrol price in South Africa.

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LOCAL GOVERNANCE AND CORRUPTION: EVIDENCE FROM INDONESIA

Taufiq Arifin*, Irwan Trinugroho*, Muhammad Agung Prabowo*, Sutaryo Sutaryo*, Muhtar Muhtar**

Abstract

This paper examines the impact of local governance on corruption in the context of Indonesia after the decentralization policy which has been implemented following the institutional reforms after the economic damage and political crisis at the end of 1990s. More specifically, we investigate whether poor governance leads to higher non-compliance cases of local government, which can be considered as a proxy for corruption and rent seeking behaviors as a whole. We use data for 446 regions at the municipal/ district level over the 2008-2010 period. Controlling for some regional factors, we confirm that poor governance leads to higher non-compliant cases either number of cases or their amount. No difference effect is found between financially distress and non-distress regions. Our findings also reveal that there is no empirical evidence on the effect of corruption on economic growth. The Indonesian economy has continued to grow in recent years, during and after the global financial crisis, as huge domestic consumption props up growth even though corruption might have reduced private and local government investments. Promoting good local governance should be continued in many aspects as good governance mechanism, especially building a strong internal control system, could minimize the possibility of local officers in such regions engaging in corrupt behavior***.

Keywords: Local Governance, Corruption, Indonesia, Internal Control System, Non-Compliant Cases, Regional Growth

**Faculty of Economics and Business, Universitas Sebelas Maret, Jl. Ir. Sutami 36A, Surakarta 57126, Indonesia*
***Faculty of Teacher Training and Education, Universitas Sebelas Maret, Jl. Ir. Sutami 36A, Surakarta 57126, Indonesia*
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1 Introduction

A long lasting debate in the economic literature on the effects of political influence on business and economics has yielded several seminal theories, such as the rent seeking theory (Krueger 1974) and the grabbing hand theory (Shleifer and Vishny 1994; 1998). Basically, these theories explain how political figures (politicians and bureaucrats) take advantage of their positions to obtain private benefits, which could be in the form of corruption, bribes, and other sources of private benefits[1].

Massive corruption still exists in Indonesia, even though several major improvements on regulatory changes, law enforcement, and local government autonomy have been implemented following the institutional reforms after the economic damage and political crisis at the end of 1990s, which impelled the country to become more democratic, decentralized, and deregulated (Henderson and Kuncoro 2011, Mursitama 2006). The reforms may have significantly improved the country's democratization and decentralization levels. However, they have also broadened the abuse of power. On the contrary, Fisman and Gatti (2002), in a cross-country study find that fiscal decentralization is negatively associated with corruption. The changes in political structure and the multiparty system have increased the number of corruption cases that involve local political figures in the executive and legislative branches as the control mechanism of the local parliament does not work properly. One phenomenon, prevalent in almost all regions in Indonesia as an impact of the large local autonomies, is the "little king," where local political figures possess the political power to play dominant roles in all aspects of life and also create corrupt bureaucracies. This coincides with the rent seeking theory (Krueger, 1974) and the grabbing hand theory (Shleifer and Vishny 1994), where bureaucrats and politicians behave in a self-interested way. Reducing and minimizing corruption is an important issue because the sale by government officials of government property for personal gain, almost the

[1] For more a detailed summary on political influence on business and economic see paper of Nys et al. (2015)

same with the definition of rent seeking (Shleifer and Vishny 1993), is an inhibiting and detrimental factor in economic growth (Sarte, 2001; Heckelman and Powell, 2010), because it creates unfair markets, constrains investments, and also directly reduces government spending for development purposes.

The present paper investigates the impact of governance of local government on corruption behavior at the regional level. More specifically, we investigate whether poor governance leads to higher non-compliance cases of local government, which can be considered as a proxy for corruption and rent seeking behaviors as a whole. We focus on the role of governance because poor public governance, more specifically in the budgeting and control systems, may create more incentives for local officers to take private benefits in the form of corruption. For example, in some cases in Indonesia, corruption comes from the exploitation of social aids that are designed in the government budget for the self-interests of local political figures and political parties. A number of empirical papers have also revealed that public governance is a major determinant to corruption (e.g. Aidt *et al*., 2008, Dreher *et al*., 2007).

Furthermore, we consider that the effect of governance on corruption depends on the financial condition of local government. Arguably, when a region is confronted with financial distress, incentives for rent seeking by local officers could be higher (Chen *et al*., 2011). Therefore, we argue that financial distress could be an exacerbating factor on the impact of poor governance on corrupt behavior. Going deeper, we also look at the impact of exogenous components of corruption, such as the effect of local governance on regional economies, measured by regional economic growth.

2 Methods

2.1 Data

To test our research questions, we study 446 Indonesian regions at the municipal/ district level over the period of 2008-2010, resulting in 854 region-year observations. We collect data from several sources. Our main sources are the financial reports of local governments, and the audit reports released by the Supreme Audit Council (*Badan Pemeriksa Keuangan*/ BPK). We also use some information from the Indonesia Statistics Bureau (BPS).

2.2 Variables

2.2.1 Corruption

We proxy corruption using two measures, the number of non-compliant cases (CASES) and the natural logarithm of amount of non-compliant cases (LNAMOUNT_CASES) as reported by the BPK in the audit report. Non-compliant cases consist of loss, potential loss, deficiencies of revenues, administrative, inefficiency, and ineffectiveness. We have attempted to collect data on real corruption cases from the Supreme Court, however, we are not able to trace when the corruption actually happens. Therefore, to avoid a time bias, we do not use this proxy. Finally, we employ the non-compliant cases, reported by the BPK in the audit report, as a measure of corruption.

2.2.2 Regional economic growth

As explain earlier, we also examine the effect of exogenous component of corruption which is local governance on regional economic, measured by regional economic growth.

2.2.3 Local governance

To measure local governance, we use two proxies as follows:

a. Internal control system (ICS). The internal control system represents how well the governments manage their internal control, especially with regard to their accounting control system and reporting, budget implementation control system, as well as the structure of internal control. Internal control in the central government and local governments are designed based on the PP No. 60/2008 on Internal Control Standards and Principle. An Internal Control System functions to provide reasonable assurance for achieving effectiveness and efficiency in financial reporting, safeguarding of assets, and compliance with laws and regulations. BPK reports the number of weaknesses on the ICS of local government in the audit report. We use this data as a proxy for local governance. Regions having more weaknesses on their ICS are considered to have poor governance.

b. Audit report (AUDIT). We also use the audit report of BPK as a measure of local accountability. BPK categorizes audit reports into four areas; unqualified (without opinion), qualified (with opinion), adverse, and disclaimer. We create a dummy variable for regions with unqualified audit reports. Local governments with financial reports that are categorized as unqualified can be considered to have good governance.

2.2.4 Financial distress (DISTRESS)

We use the *Debt Service Coverage Ratio* (DSCR) defined in the *PP No. 54/ 2005* to measure the financial distress of local government. A value of 1 is given for regions having DSCR<2.5 (financially distressed regions), and 0 otherwise. Financial distress could be a proxy for incentives for rent seeking because local governments facing a large fiscal deficit have a greater need to expropriate assets from enterprises (Chen *et al*., 2011).

We also interact DISTRESS with the proxies of local governance (ICS and AUDIT) to examine the moderating role of financial distress on the effect of local governance on rent seeking.

2.2.5 Control variables

We include a vector of variables to control for regional specificities. First, we include a natural log of regional revenue (LNREV) and a natural logarithm of total assets of local government (LNTA) to capture the economic size of the local government. Supposedly, the larger the region, the more the likelihood of corruption. We also take into account a set of dummy variables for islands where these regions exist.

2.3 Model

To test the effect of local governance on corruption, we develop this following specification:

$$CASES_{i,t} = \alpha_0 + \alpha_1 ICS_{i,t} + \alpha_2 AUDIT_{i,t} + \alpha_3 LNREV_{i,t} + \alpha_4 LNTA_{i,t} + \alpha_5 FD_{i,t} + \alpha_6 ICS*FD_{i,t} + \alpha_7 AUDIT*FD_{i,t} + \alpha_8 JAWA_i + \alpha_9 SUMATRA_i + \alpha_{10} KALIMANTAN_i + \alpha_{11} SULAWESI_i + \alpha_{11} EASTINDO_i + YEARS + \varepsilon_{i,t} \quad (1)$$

Where i, t represents region and time, respectively. YEARS represents a vector of year (time) dummies.

To estimate this equation, we use a pooled regression with time-fixed effects to control for time differences. We do not apply an individual fixed effects panel data technique as the individual fixed effect is close to the dummies for islands. However, we report the results when we change dummies for islands with individual fixed effects in the robustness check section.

To examine the impact of the exogenous components of corruption on economic growth, we specify the equation as follows:

$$GROWTH_{i,t} = \alpha 0 + \alpha 1 CASES_{i,t} + \alpha 2 LNREV_{i,t} + \alpha 3 LNTA_{i,t} + \alpha 4 JAWA_i + \alpha 5 SUMATRA_i + \alpha 6 KALIMANTAN_i + \alpha 7 SULAWESI_i + \alpha 8 EASTINDO_i + YEARS + \varepsilon i,t \quad (2)$$

We estimate equation 2, the impact of corruption on regional economic growth, using a two-stage least square (2SLS) technique that enables us to overcome the endogeneity problem because corruption is an endogenous variable in our model. The instrument variables for corruption are local governance proxies– internal control system (ICS) and audit report (AUDIT).

3 Results and discussions

Table 1 reports the descriptive statistics for variables. Table 2 presents the correlation matrix among variables. Our proxies of local governance are found to meet the expectations on their correlations with the proxies of corruption.

Table 1. Descriptive statistics

CASES is the number of noncompliant cases. LNAMOUNT_CASES is the amount of noncompliant cases. GROWTH is the regional economic growth (in percentage). ICS is the number of weaknesses on the internal control system. AUDIT is the audit report of local government budget, taking a value of 1 for regions with unqualified audit report. DISTRESS is a dummy of financial distress, taking a value of 1 for those facing financial distress. LNREV is the natural logarithm of region' revenue, while LNTA is the natural logarithm of total assets of local government.

	CASES	LNAMOUNT_CASES	GROWTH	ICS	AUDIT	DISTRESS	LNREV	LNTA
Mean	13.574	21.740	6.176	8.952	0.062	0.255	24.105	27.923
Median	13.000	21.860	5.690	8.000	0.000	0.000	24.006	27.943
Maximum	51.000	27.664	249.040	36.000	1.000	1.000	27.551	31.116
Minimum	1.000	14.798	-15.160	1.000	0.000	0.000	19.843	24.175
Std. Dev.	6.584	1.571	8.787	4.426	0.241	0.436	1.035	0.771
Skewness	1.204	-0.374	24.795	1.370	3.630	1.123	0.126	-0.669
Observations	854	854	854	854	854	854	854	854

Table 2. Correlation matrix

CASES is the number of noncompliant cases. LNAMOUNT_CASES is the amount of noncompliant cases. GROWTH is the regional economic growth (in percentage). ICS is the number of weaknesses on the internal control system. AUDIT is the audit report of local government budget, taking a value of 1 for regions with unqualified audit report. DISTRESS is a dummy of financial distress, taking a value of 1 for those facing financial distress. LNREV is the natural logarithm of region' revenue, while LNTA is the natural logarithm of total assets of local government.

	CASES	LNAMOUNT_CASES	GROWTH	ICS	AUDIT	DISTRESS	LNREV	LNTA
CASES	1							
LNAMOUNT_CASES	0.471	1						
GROWTH	0.021	0.003	1					
ICS	0.274	0.161	0.026	1				
AUDIT	-0.126	-0.077	-0.021	-0.062	1			
DISTRESS	-0.044	-0.014	0.044	0.034	-0.017	1		
LNREV	-0.130	-0.077	-0.070	-0.019	0.027	0.066	1	
LNTA	-0.103	0.035	-0.031	-0.014	0.068	0.068	0.750	1

Table 3 presents the regression results on the effect of local governance on corruption. Column 1 and 2 reports the results when the dependent variable is the number of noncompliant cases, while columns 3 and 4 present the results when we use the natural log of the amount (nominal value) of non-compliant cases as a proxy for rent seeking.

Table 3. Regression results of equation 1

CASES is the number of noncompliant cases. LNAMOUNT_CASES is the amount of noncompliant cases. ICS is the number of weaknesses on the internal control system. AUDIT is the audit report of local government budget, taking a value of 1 for regions with unqualified audit report. DISTRESS is a dummy of financial distress, taking a value of 1 for those facing financial distress. LNREV is the natural logarithm of region' revenue, while LNTA is the natural logarithm of total assets of local government. ICS*DISTRESS is the interaction between ICS and DISTRESS. AUDIT*DISTRESS represents the interaction between ICS and DISTRESS. The values in parentheses are standard errors. ∗, ∗∗ and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Non-Compliant Cases (CASES)		Amount of Non-Compliant (LNAMOUNT_CASES)	
	1	2	3	4
Weaknesses on Internal Control System (ICS)	0.366***	0.348***	0.051***	0.045***
	(0.046)	(0.059)	(0.006)	(0.006)
Audit Report (AUDIT)	-2.860***	-3.029***	-0.527**	-0.604**
	(0.356)	(0.555)	(0.219)	(0.272)
Financial Distress (DISTRESS)	-0.915	-1.657	-0.111	-0.376
	(0.596)	(1.245)	(0.150)	(0.325)
Natural Log Regional Revenue (LNREV)	-0.361	-0.367	-0.234**	-0.235**
	(0.312)	(0.301)	(0.097)	(0.094)
Natural Log Total Assets (LNTA)	0.100	0.118	0.445***	0.450***
	(0.527)	(0.537)	(0.117)	(0.117)
ICS*DISTRESS		0.076		0.027
		(0.106)		(0.019)
AUDIT*DISTRESS		0.741		0.355
		(0.674)		(0.424)
Constant	14.428**	14.282**	14.326***	14.266***
	(6.918)	(7.209)	(1.202)	(1.228)
Year dummies	Included	Included	Included	Included
Island dummies	Included	Included	Included	Included
Method	OLS	OLS	OLS	OLS
Number of Regions	446	446	446	446
Number of Observations	874	874	869	869
Period	2008-2010	2008-2010	2008-2010	2008-2010
R-Squared	0.119	0.12	0.083	0.084

We find strong evidence on our two measures of local governance. As expected, the higher the number of weaknesses in the internal control system (ICS), the higher the noncompliant cases, as well as the nominal value of noncompliant cases. Moreover, regions with unqualified audit reports are found to have fewer noncompliant cases, as shown by the negative coefficients of the audit report variable on our proxies for corruption. In general, our findings confirm that poor local governance is associated with corruption, in line with the findings of Aidt et al. (2008) and Dreher et al. (2007). Regions with poor governance might create more incentives for local officers to take private benefits in the form of corruption.

Turning to the moderating effect of the fiscal condition of regional government on rent seeking behaviors, we do not find evidence that budget deficits, proxied by financial distress, strengthen the impact of poor governance on corruption, which can be seen through the insignificant coefficients on the interactions between local governance measures and financial distress. These results do not confirm the findings of Chen *et al*. (2011), in the context of China, that financial distress could also be an exacerbating factor for rent seeking behaviors as it drives a greater need for local offices to seek private benefits.

Table 4. Regression results of equation 2

This table presents the regression results on the impact of corruption on regional economic growth. CASES is the number of non-compliant cases. LNAMOUNT_CASES denotes the amount of non-compliant cases. GROWTH is the regional economic growth (in percentage). ICS is the number of weaknesses on the internal control system. AUDIT is the audit report of local government budget, taking a value of 1 for regions with unqualified audit report. DISTRESS is a dummy of financial distress, taking a value of 1 for those facing financial distress. LNREV is the natural logarithm of region' revenue, while LNTA is the natural logarithm of total assets of local government.

	Dependent Var: GROWTH	
Non-Compliant Cases (CASES)	0.113	
	(0.167)	
Amount of Non-Compliant Cases (LNAMOUNT_CASES)		0.831
		(1.144)
Financial Distress (DISTRESS)	0.814	0.820
	(0.698)	(0.705)
Natural Log Regional Revenue (LNREV)	-1.108**	-0.990*
	(0.467)	(0.545)
Natural Log Total Assets (LNTA)	0.786	0.416
	(0.593)	(0.784)
Constant	9.128	-0.019
	(12.330)	(20.835)
Year dummies	Included	Included
Island dummies	Included	Included
Method	2SLS	2SLS
Number of Observations	859	854
Period	2008-2010	2008-2010
Wald	chi2(9) = 17.26 (0.04)**	chi2(9) = 17.39 (0.04)**

Table 4 presents the regression results on the impact of corruption on regional economic growth. Using a 2SLS method, our empirical results do not show that corruption is negatively correlated with economic growth as shown by insignificant coefficients of the proxies of corruption. It might not be too surprising in the context of Indonesia. Massive corruption in Indonesia might have constrained private investments and have reduced local government spending for development purposes. However, huge domestic consumption has kept the economy growing. Arguably, the Indonesian economy has continued to grow in recent years, during and after the global financial crisis, as huge domestic consumption props up growth, even though corruption might have reduced private and government investments.

We do some robustness checks to ensure the findings. First, we alternate the proxy of local governance to the transparency of local governments. We measured transparency based on the extent to which they disclose information on their website. We created an index that ranges from 0–15 to calculate the transparency of local government. However, we have to do our estimation via crosssection research, as we retrieved data only in one period. We find little evidence that transparency of local governments reduces incentives for corruption by local officers. Second, we exclude dummy variables for islands. This enables us to estimate our empirical model using a

fixed-effect panel data technique. The results are unchanged when accounting for our main variables. Third, we exclude regions in Java and Bali Islands, as these two islands are considered the most developed islands. For some variables, the coefficients are eroded. However, the results of local governance variables are consistent. Fourth, we orthogonalize the natural log of revenue and the natural log of total assets because their correlation is relatively high. Again, we still find consistent results on our main variables. Fourth, we orthogonalize the natural log of revenue and the natural log of total assets because their correlation is relatively high. Again, we still find consistent results on our main variables. Fifth, we change regional economic growth to investment growth (domestic and foreign) as the factor that is impacted by corruption. As the data on investment at the provincial level are not available, we do regressions at the provincial level. We find little evidence that corruption is negatively associated with investment growth.

4 Conclusion

We study the effect of local governance on rent seeking behaviors, more specifically corruption in the context of Indonesia using an empirical method. Using data for 446 Indonesian regions at the municipal/district level over the period of 2008-2010, we find that poor local governance, measured by weaknesses in the internal control system by audit reports, is significantly associated with corruption, proxied by the number of noncompliant cases as well as amount of the cases. Our results do not show that financial distress exacerbates the impact of poor governance on rent seeking. Our findings also reveal that there is no empirical evidence on the effect of corruption on economic growth. We argue that the Indonesian economy has continued to grow in recent years, during and after the global financial crisis, as huge domestic consumption props up growth even though corruption might have reduced private and local government investments. In additional, we find little evidence that corruption is correlated with lower investment growth, which we present as a robustness check.

Nevertheless, we admit some limitations. First, our study uses only a short period of time (3 years). Second, we do not separate the noncompliant cases, our proxy of corruption, into a more specific kind of case, as one might argue that not all noncompliant cases should be considered as kinds of corruption.

Although several caveats should be considered to interpret our findings, several policy implications are provided according to our empirical results. Of course, promoting good local governance should be continued in many aspects. A good governance mechanism, especially building a strong internal control system, could minimize the possibility of local officers in such regions engaging in corrupt behavior.

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BREAKING THE GLASS CEILING – A CASE OF DURBAN CORPORATE WOMEN

Siphosenkosi Zanoxolo Makaula*, Alec Bozas*, Elias Munapo*, Vannie Naidoo*

Abstract

The glass ceiling is a concept that most frequently refers to barriers faced by women who attempt, or aspire, to attain senior positions as well as higher salary levels in corporations, government, education and non-profit organisations. It can also refer to racial and ethnic minorities and men when they experience barriers to advancement. A glass ceiling appears to exist in many organisations and also maybe a glass cliff, in which women are promoted into risky upper-level positions in which failure and subsequent loss of the high-level position is likely. This research investigated perceptions that Durban corporate women have towards the notion of glass ceiling barriers at work. A sample was chosen on a non-probability basis using convenience sampling of corporate women within Durban. Ninety participants completed the questionnaire. The data collected was analysed using descriptive and inferential statistics. The findings revealed that women do not experience glass ceiling barriers to career advancement. Women also feel confident and respected by colleagues, subordinates and leadership and are capable of executing their designated duties. Respondents also showed confidence in the Employment Equity Act which suggests that the transformation charter is followed at their organisations.

Keywords: Glass Ceiling, Women, Corporate, Employment Equity

**University of KwaZulu-Natal, Westville Campus, Durban, South Africa*

1 Introduction

Artificial barriers to the advancement of women and minorities are the glass ceilings that hinder women in the workplace. The motivation for undertaking this study is the plight of women in corporate environment. After 17 years of democracy in South Africa, women still experience gender discrimination at work. However, this phenomenon is not unique to South Africa. Women reaching top-level positions are still uncommon in the corporate and private sector. Despite women having the ability, motivation, drive, professional skills, and experience necessary to be effective, women leaders are still held back. "The glass ceiling is a concept that most frequently refers to barriers faced by women who attempt, or aspire, to attain senior positions as well as higher salary levels in corporations, government, education and non-profit organisations, it can also refer to racial and ethnic minorities and men when they experience barriers to advancement" (Lockwood, 2004:1).

Grobler et al. (2006: 22) say that "gender discrimination continues to occur, although progress has been made, they assert that a glass ceiling for women who aspire top management still exists". Kreitner and Kinicki (2008) added that it is an invisible barrier that segregates women and minorities from climbing the corporate ladder to senior roles in organisations.

Kreitner and Kinicki (2008: 44) said that "women therefore, find themselves stuck in lower level jobs, ones that do not have profit-and-loss responsibility and those with less visibility and influence". Grobler et al. (2006: 22 - 23) said that "With more single parents and dual-career couples, balancing the demands of home and work has become the great challenge of the typical South African worker and their employer, when there is a conflict between work and family, the family is three times more likely to suffer than the employees job performance".

In South Africa, the Employment Equity Act has spearheaded the drive for employment equity and affirmative action within organisations, including the employment and progression of women. In some spheres these drives have been successful and the demographics within South African business have changed with more women holding senior executive positions than before. The question to ask however is how many of these women actually hold positions of power in top management, and the reality is very few.

The advent of the Employment Equity Act has resulted in an inflow of females into the place of work. Business Women's Association Census (2007:16) indicates that 42.9 per cent of total employed population in the Republic of South Africa are women. This achievement is to a degree a product of a statutory change in industry and employment equity yielding employers.

Baxter (2007:81) contends that the numbers indicate that women in management and decision-making positions are still nowhere near representative

of the probable female personnel. In actuality, most of the high level jobs are held by men. Most organisations have moved towards equal representation in their employment equity status, but the same can seldom be said of their management and executive positions.

Women have been held back in industry through various factors. According to Helgesen (1998: 46–47), women have a long tradition of moving in and out of the workplace in order to care for aging parents; they generally feel less stigma than men when they have taken periods off; with less seniority, women have less job security and so often have been the first casualties of downsizing; they have been driven from large organizations at a faster rate than men by the persistence of the glass ceiling; they are more likely than men to seek retraining on their own time and using their own money. Thus, some of the very disadvantages that held women back in the industrial workplace are now often proving advantageous enabling women to the realities of the information economy, and pushing them to improvise individual solutions to the pervasive instability that confronts us all.

Baxter and Wright (2000:276) asserted that glass ceiling implies an impenetrable barrier that blocks upward movement of women. They said that "below this barrier, women are able to get promoted, beyond this barrier, they are not" Reskin and Padavic (1994:82) suggest that "a glass ceiling blocks the on the-job mobility of women of all classes, as well as minorities of both sexes".

Another factor that can hold woman back is self-confidence. "Self-confidence is a person's belief that he or she can succeed, self-confidence is context-specific to particular tasks and some people seem to display this characteristic through a wide range of activities" (Perry, 2011: 219). Keating (2002:28) argued that "college-age women, women just entering the workforce and women changing careers are ripe for mentoring. It can boost your self-esteem, make you feel more competent and develop your professional identity"

Hillman et al. (1989), Greenhouse and Bordin (1994), Denmark and Guttentag (1987), Korman et al. (1989), Crocker and Luhtanen (1990), all cited in Soufi, et al, (2011) examined the following issue of women relating to their self-esteem as follows:

- Employed women have higher self-esteem more than housewives.
- Women who have high self-esteem show great desire to continue studying and achieve to aims.
- People who have high self-esteem choose further jobs and careers that they have more ability in it.
- One of the barriers to employment for women in them is lack of self-esteem or lack of accountability for employment.
- Barriers to acceptance of women in middle management level posts include: Organisational barriers ,
- Family, cultural and social barriers
- There are significant relationship among manager's attitudes than technical skills, human, perception, loyalty, organisation commitment and lack of promotion of women in their employment.

Respect is another factor that woman look for within an organisation. Rawls (1971: 530) stated that, ''one of the entitlements that individuals are due by virtue of their humanity is the right to be treated in a way that fosters positive self-regard''

The purpose of the Employment Equity Act, 55 of 1998 is to achieve equity in the workplace, by:

- Promoting equal opportunity and fair treatment in employment through the elimination of unfair discrimination; and
- Implementing affirmative action measures to redress the disadvantages in employment experienced by designated groups, to ensure their equitable representation in all occupational categories and levels in the workforce.

Change is a vital ingredient that transforms organisation. Women need to be actively embraced in top level management positions in the corporate world. Van Zyl and Roodt (2003:15) said that "women with children will constitute a major component of labour supply". Women could no longer be treated as second-class workers. Employers would need to recognise career ambitions and domestic responsibilities. The only way to know how organisations would fare is by means of an employment equity audit. However, there still may be a possibility that an instrument used for assessing employment equity could still be biased and thereby further entrenching gender discrimination.

2 Research methodology

The aim of this study was to assess if corporate women in Durban encounter glass ceiling barriers to career development. The following objectives were formulated for the study.

2.1 Objectives

- To assess if women experience the glass ceiling barrier to career advancement.
- To assess how women balance family commitments and workplace commitments.
- To assess if women are confident in their ability to fulfil their roles at work.
- To assess if women in the work place think that they are respected for their ability and skills.
- To assess women's views on the Employment Equity Act.

2.2 Respondents and location of the study

The study was conducted in Durban. The research was confined to women working for Durban based companies and organizations.

2.3 Population

The target population consisted of all women working for Durban companies and organizations. Unfortunately there is no data to support the population numerically such as Statistics South Africa's data on Durban working population.

2.4 Sampling

2.4.1 Sampling design

Due to time and cost constraints and despite its restrictions, snowball sampling was selected as the most suitable for this research. The respondents were selected on non-probability snowball sampling from the population of Durban corporate women and respondents that were known to the researcher. Some of the respondents assisted in identifying other potential respondents who were then invited to participate in the research.

2.4.2 Sample size

Given the time and resource constraints the sample size was limited to 107.

2.5 Questionnaire as a research instrument

An electronic questionnaire was chosen as the research instrument. The questionnaire was administered on the web through 'Questionpro'. Electronic questionnaires are easy to administer, inexpensive, fast and have a global reach. The closed type questionnaire had 21 of the 26 questions in five – point "Likert scale" form and this was intended to scrutinize whether participants "strongly disagreed", "disagreed", "uncertain", "agreed" and "strongly agreed" with the statements.

2.6 Pretesting, validation and reliability

Pretesting and validation is done to fish out imperfections in the design of the research apparatus. Pretesting and warranting reliability and validity of the questionnaire is very important. In this study questionnaire was tested on a small batch of respondents, feedback was positive and the necessary changes were made. The minor changes were made to remove vagueness and misleading or ambiguous questions. For the purposes of this study the Cronbach's alpha coefficient was used to determine the reliability of the questionnaire. An alpha coefficient of $(\frac{21}{26} = 0.808)$ was found, and it showed a very good rate of internal reliability for the questionnaire.

2.7 Limitations of the research

Most of the studies are challenged by some limitations. The following limitations were identified for this study. Due to time and funding constraints, the data was collected from a small sample of corporate women in Durban. Non-probability purposive sampling used for this study is the least reliable in terms of generalisation.

2.8 Questionnaire administration

Web based surveys are more well-organized and eye-catching hence in this study the web based online software programme was used. The choice selected was to email the URL link to possible respondents. This was done using the respondents email addresses.

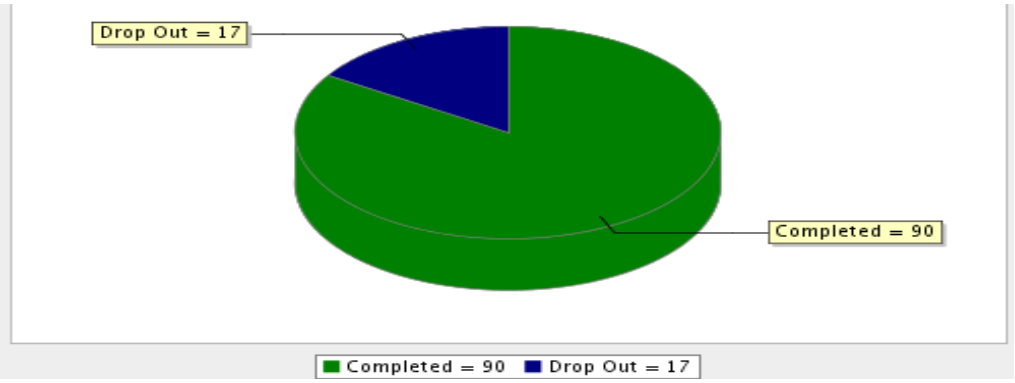
3 Analysis of data

The Statistical Package for the Social Sciences (SPSS) software was used to analyse the data.

4 Presentation of results

107 respondents were targeted and 90 completed the survey, representing 84% completion as shown in Fig 1. The incomplete questionnaires were discarded and only data from the completed questionnaires was used.

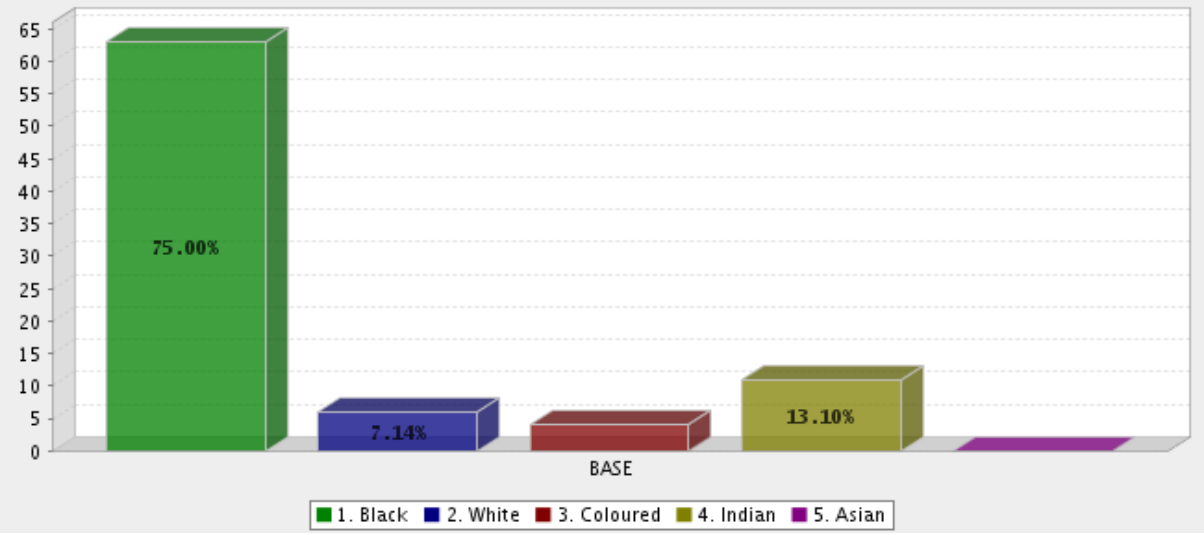
Figure 1. Survey completion overview



4.1 Race

Figure 2 shows race representation in percentage form. 75% respondents were Black or African, 13.1% respondents were Indian, 7.14% respondents white a low number of responses from Coloured and Asian respondents was witnessed.

Figure 2. Race representation

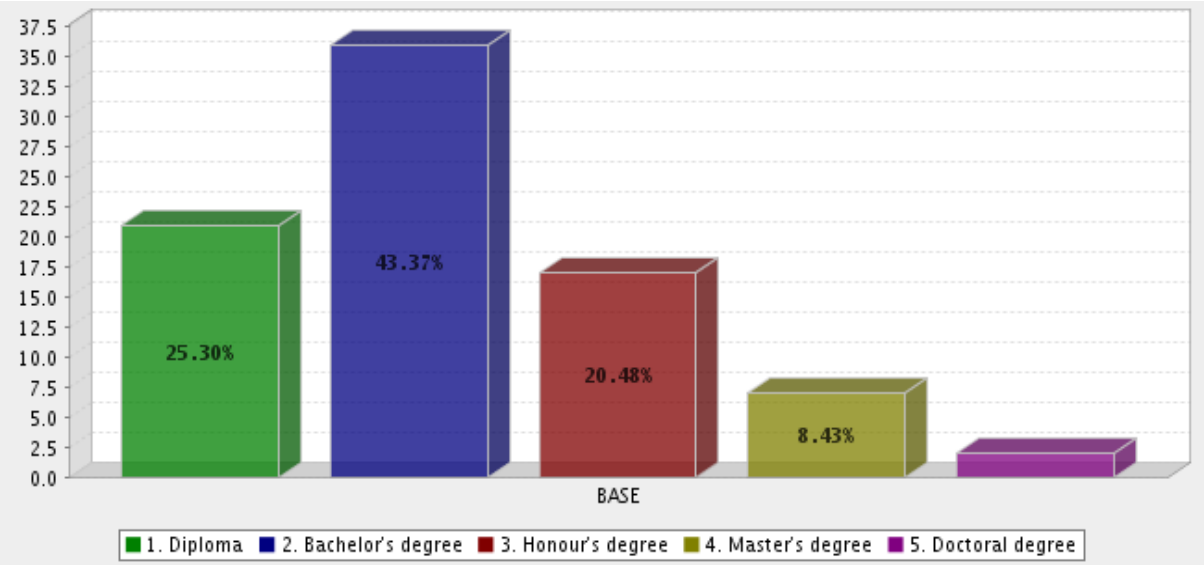


Race classification in South Africa is somewhat confusing as illustrated in Figure 2. It is not clear whether the low representation of Coloured and Asians is attributed to their low representation in Durban or from the fact that they generally classify themselves as Black.

4.2 Highest level of education

Figure 3 shows the highest level of education of respondents. 43.37% respondents held a Bachelor's degree while 25.30% of respondents held diplomas and 20.48% have Honours degrees.

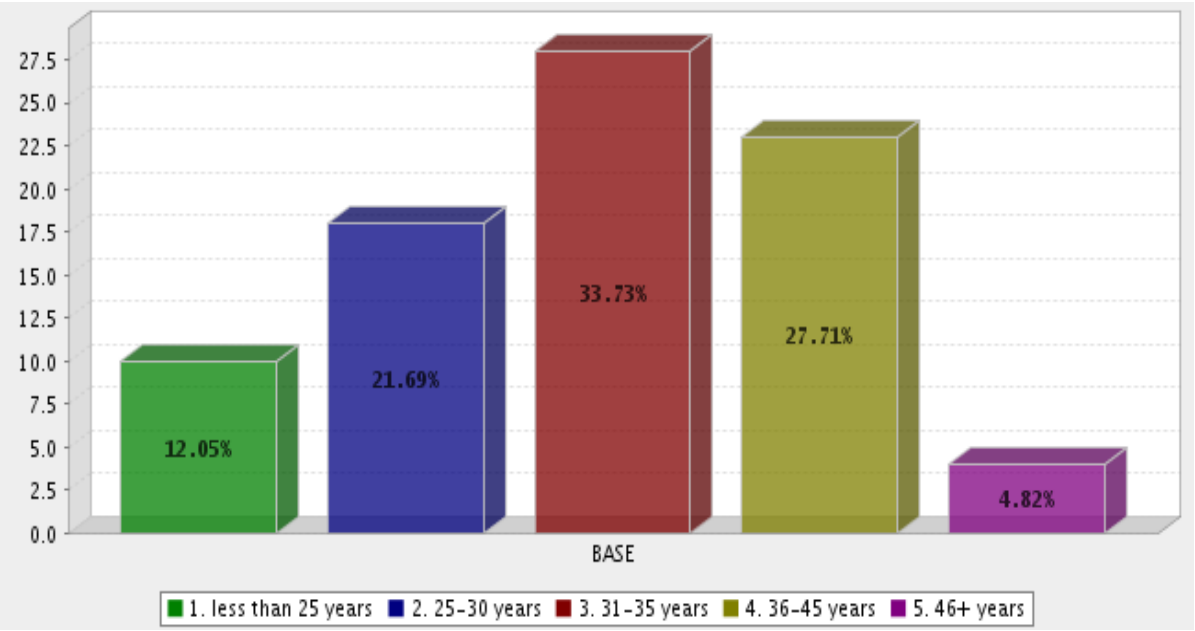
Figure 3. Highest level of education



4.3 Age

Figure 4 shows that 33.73% of respondents were between 31-35 years of age while only 4.82% were above 46 years.

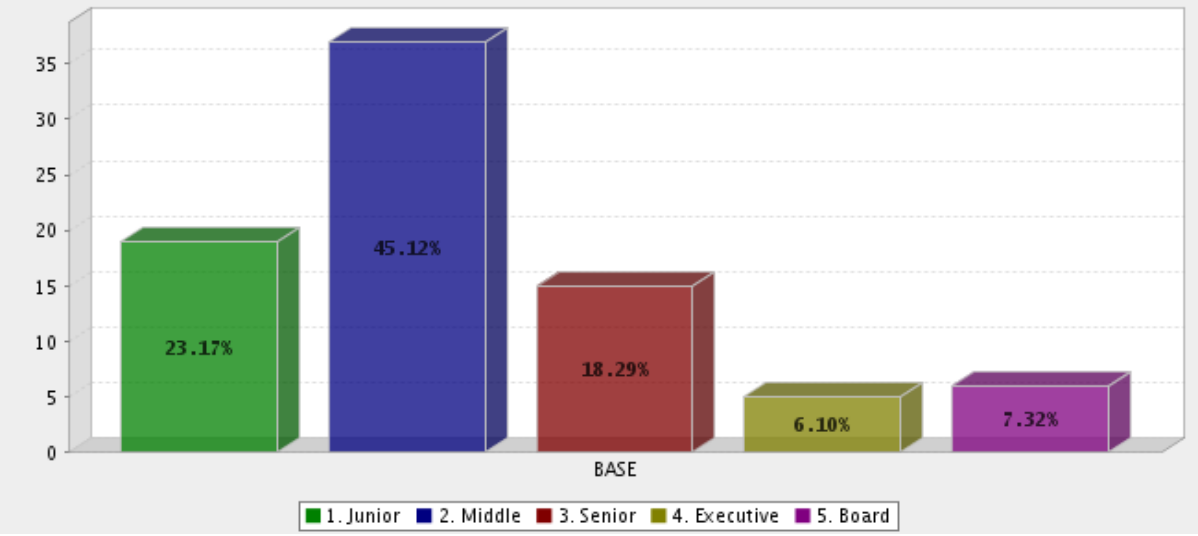
Figure 4. Age representation



4.4 Level in organisation

Figure 5 shows that 45.12% respondents were in middle management positions, while 6.10% and 7.32% were in executive and board levels respectively.

Figure 5. Level in organisation



The research was limited to Durban corporate women and hence low responses from senior, executive and board members as they are mainly based in Johannesburg and Cape Town at corporate head-quarters of their organisations.

Figure 6 shows 29.63% of respondents disagreed and 16.05% strongly disagreed with the statement. Some 22.22% agreed and 14.81% strongly agreed to the statement. In total 17.28% were uncertain. These results present neutrality in general as far as women perception towards being appreciated for their efforts in a male dominated work setting.

Figure 7 shows that a majority of respondents 42.68% disagreed and 17.07% strongly disagreed with the statement. Some 26.83% agreed and 4.88% strongly disagreed to it. The respondent's majority do not agree that their academic qualifications are not recognised in a male dominated work setting.

Figure 8 shows that 33.33% of respondents disagreed with the statement while 14.81% strongly disagreed to the statement. 28.40% of respondents

agreed with the statement and 14.81% strongly agreed. There was a mix in women perception about promotion. There was almost a balance between respondents who agree and those who disagree to the statement.

Figure 9 shows that a 40.78% disagreed with the statement and 11.11% strongly disagreed with the statement. Some 28.40% agreed with the statement and 9.88% strongly agreed. Women generally disagree to a perception that male stereotypes hinder their potential to be promoted.

4.5 Industry

Table 1. Respondents respective industries

Industry	No. of Respondents
Engineering	10
Accounting and Finance	13
Energy	8
Banking	6
Petrochemical	8
Manufacturing	3
Logistics and Transport	8
Higher education	11
Policing	3
Information Technology	1
Government department	6
Media	1
Human Resources	1
Agriculture	1
Construction	4
Fast Moving Consumer Goods (FMCG)	1
Health and Safety	3
Hospitality	2
Total	90

Figure 6. My work experience is not fully appreciated in a male dominated workplace

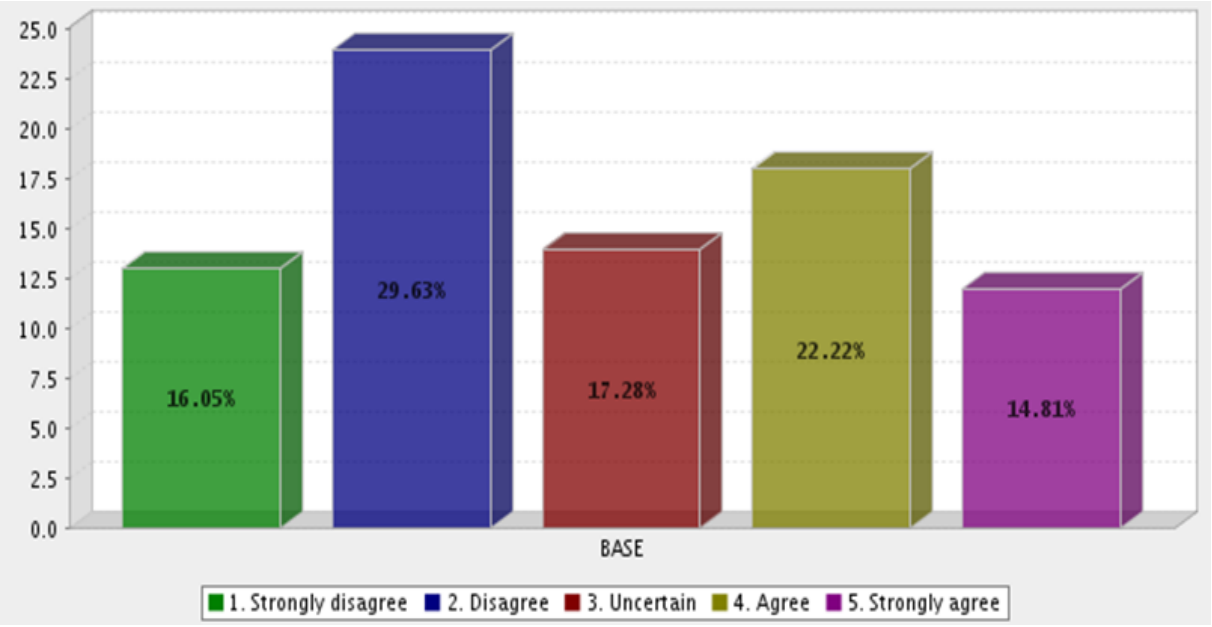


Figure 7. My academic qualifications do not mean much in a male dominated workplace

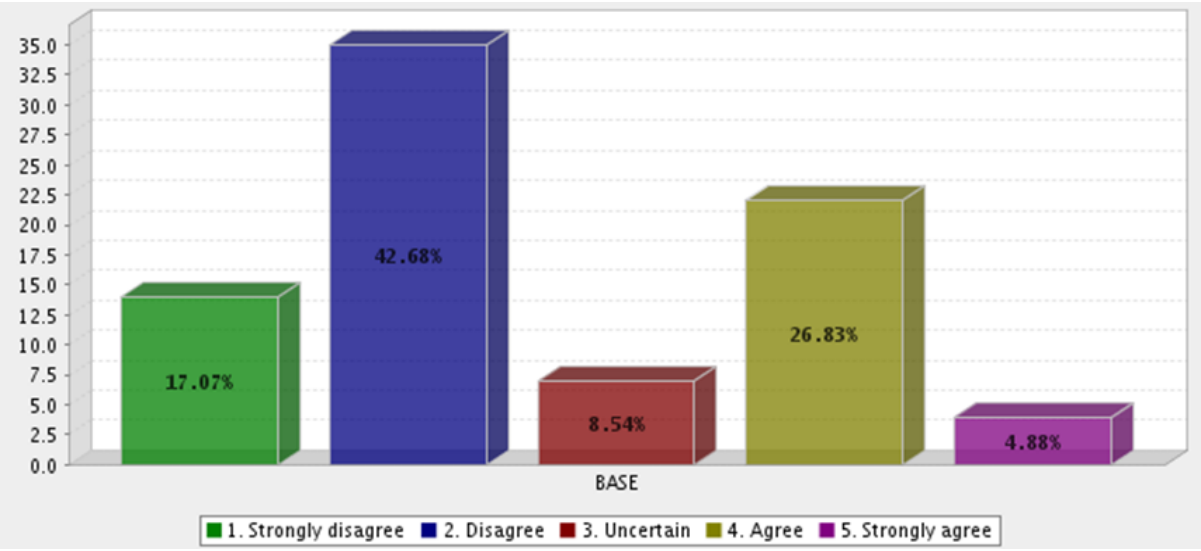


Figure 8. Higher level roles are reserved for men

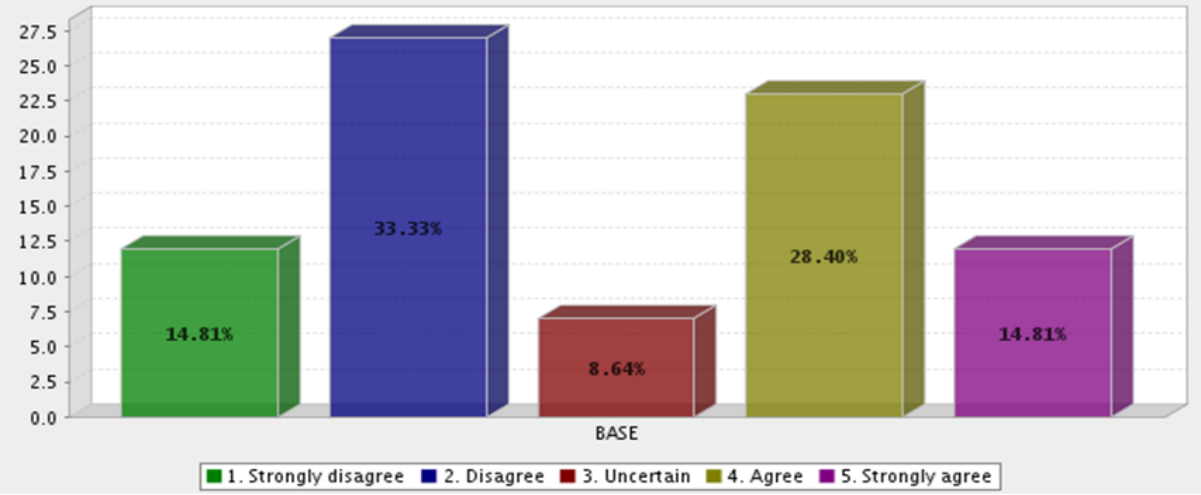


Figure 9. I feel that male stereotypes hinder my potential to land better and influential positions

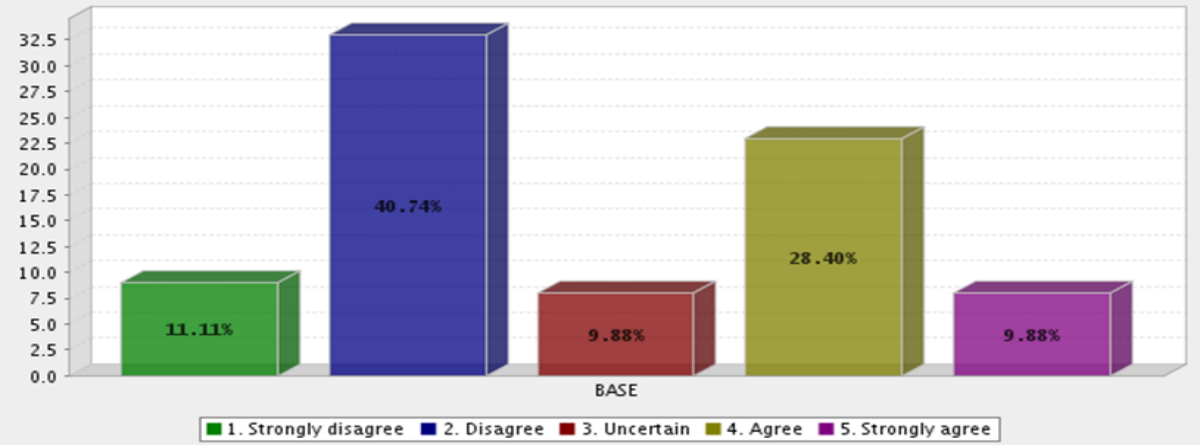


Figure 10 shows that 40.74% of respondents disagreed with the statement and 13.58% strongly disagreed with the statement. Some 24.69% agreed with statement and 14.81% strongly agreed. Women disagree to the statement and the implication is that those with family have a good balance for work vs. family commitments.

Figure 10. I give more priority to family commitments than work commitments

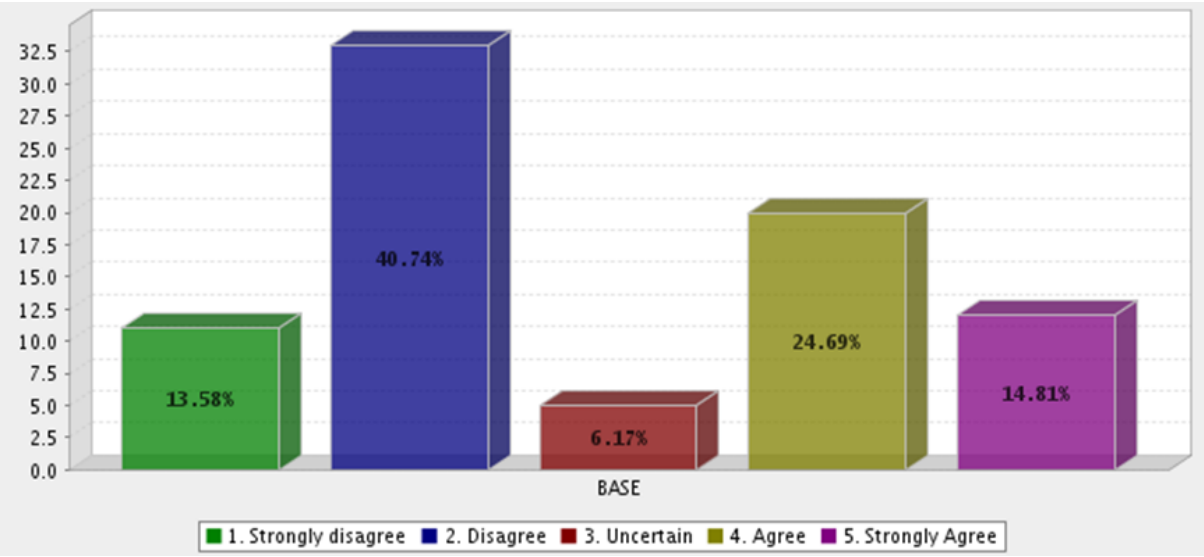


Figure 11 shows that 35.37% of respondents agreed to the statement and 18.29% strongly agreed with statement. Some 25.61% disagreed and 10.98% strongly disagreed. The general perception to the statement is that maternal responsibilities are primary to women. This statement somewhat contradicts the previous one as women felt they have a struck a balance between family and work commitments.

Figure 11. I am a mother first and a corporate woman second

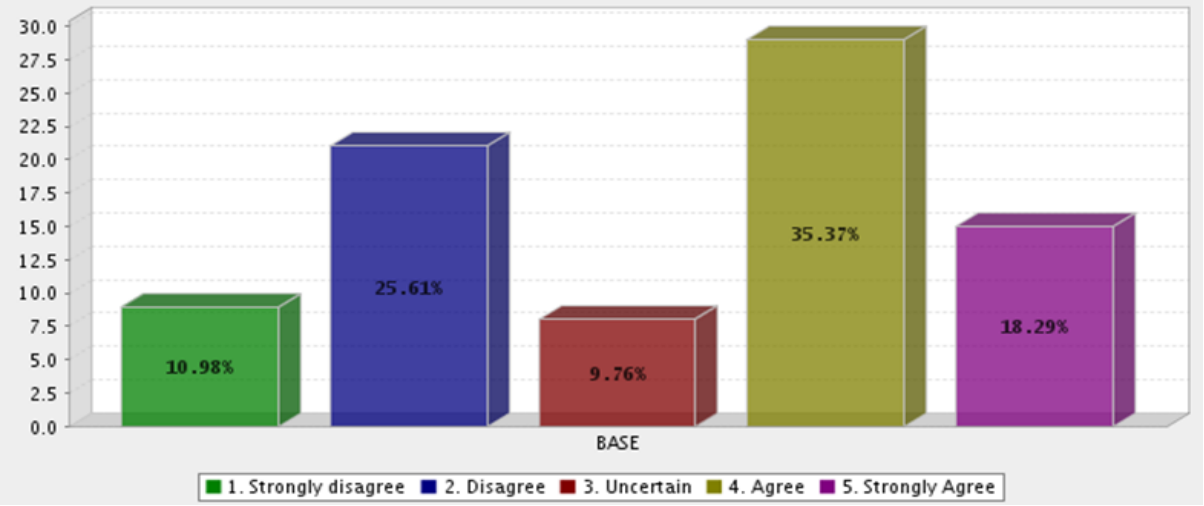


Figure 12 shows that 36.71% of respondents agreed with the statement and 26.58% strongly agreed with statement. Some 24.05% disagreed with the statement and 11.39% strongly disagreed. Women generally prefer being close to their families and not be away for extended periods.

Figure 12. I prefer working in an office close to home as I do not want to be away from my family for extended periods

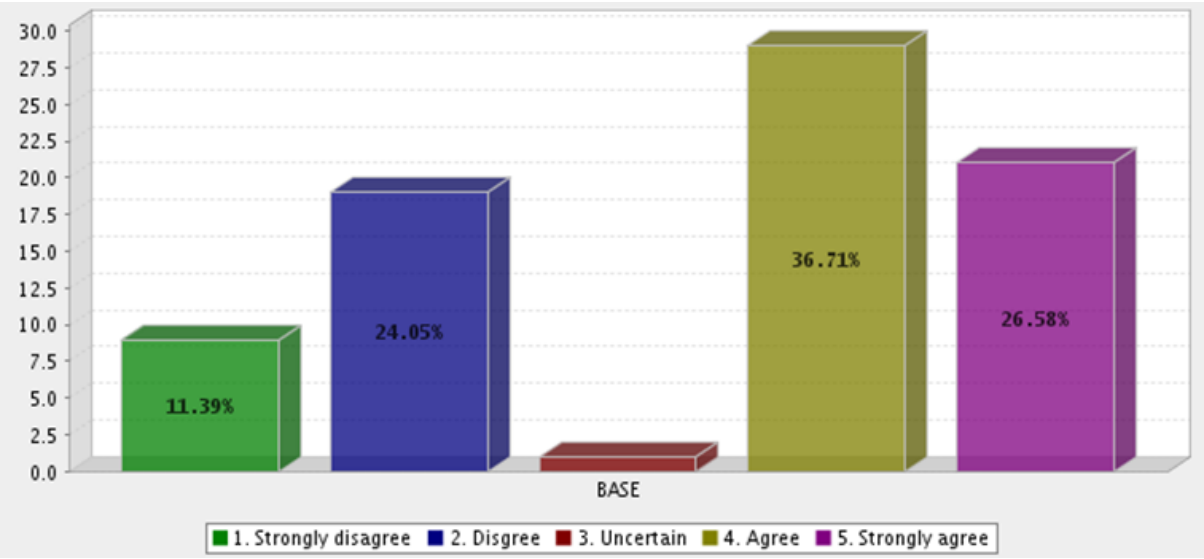


Figure 13 shows that 36.25% of respondents disagreed with the statement and 25.00% of respondents strongly disagreed with the statement. Some 15.00% of respondents agreed with the statement and 11.25% strongly agreed with the statement. In total 12.50% of respondents were uncertain. Women disagree with the statement; the responses show that they are generally comfortable with expatriate assignments.

Figure 13. I am reluctant to accept assignments that require long periods of time away from home; I would rather my male counterpart take up such assignments

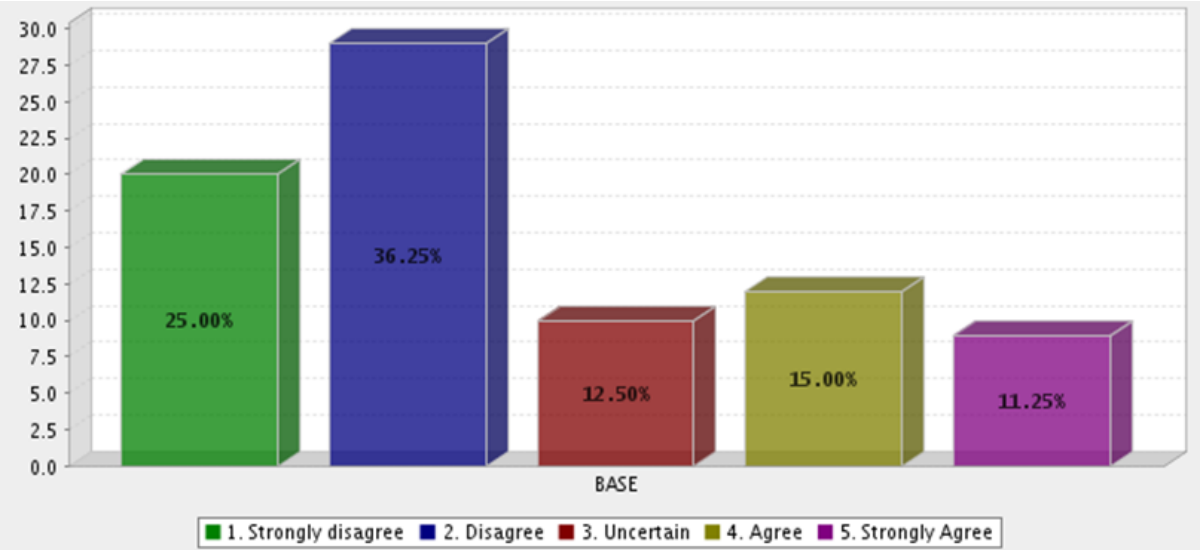


Figure 14 shows that the majority of respondents 44.44% disagreed with the statement and 17.28% strongly disagreed with the statement. Some 18.52% agreed with the statement and 11.11% strongly agreed. Women disagree with the statement, the majority of responses show that women are comfortable with networking sessions that happen after hours and on weekends.

Figure 14. I am not comfortable with corporate networking sessions that go beyond working hours

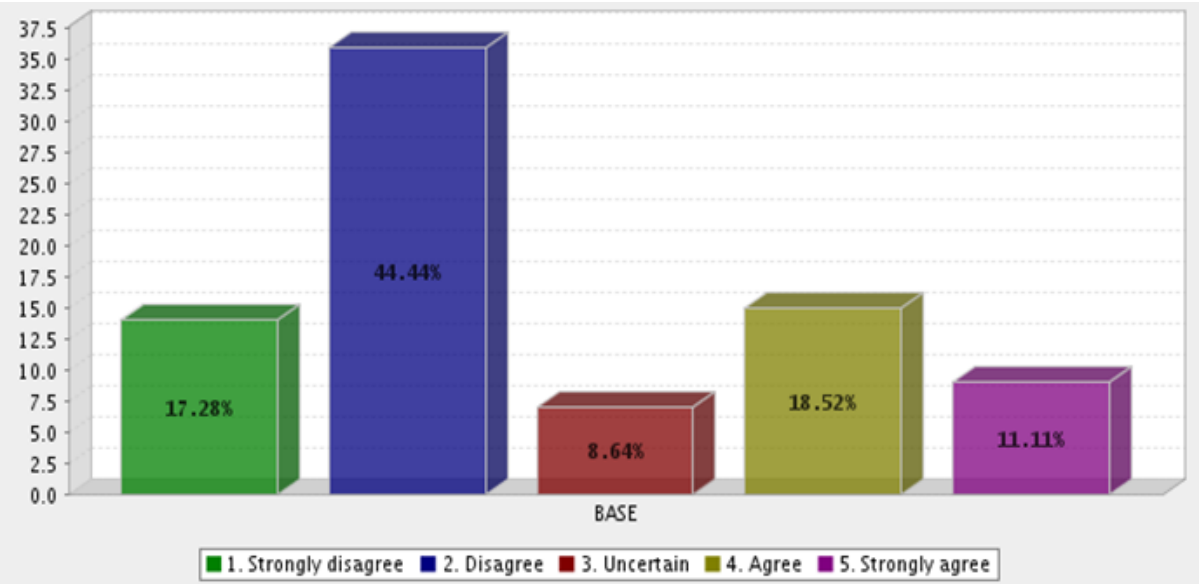


Figure 15 shows that 44.44% and 38.27% of respondents disagreed and strongly disagreed with the statement respectively. Only a small number of respondents were positive with only 6.17% for both agreed and strongly agreed. According to the responses women are not intimidated by male competition.

Figure 15. I am intimidated by male competition

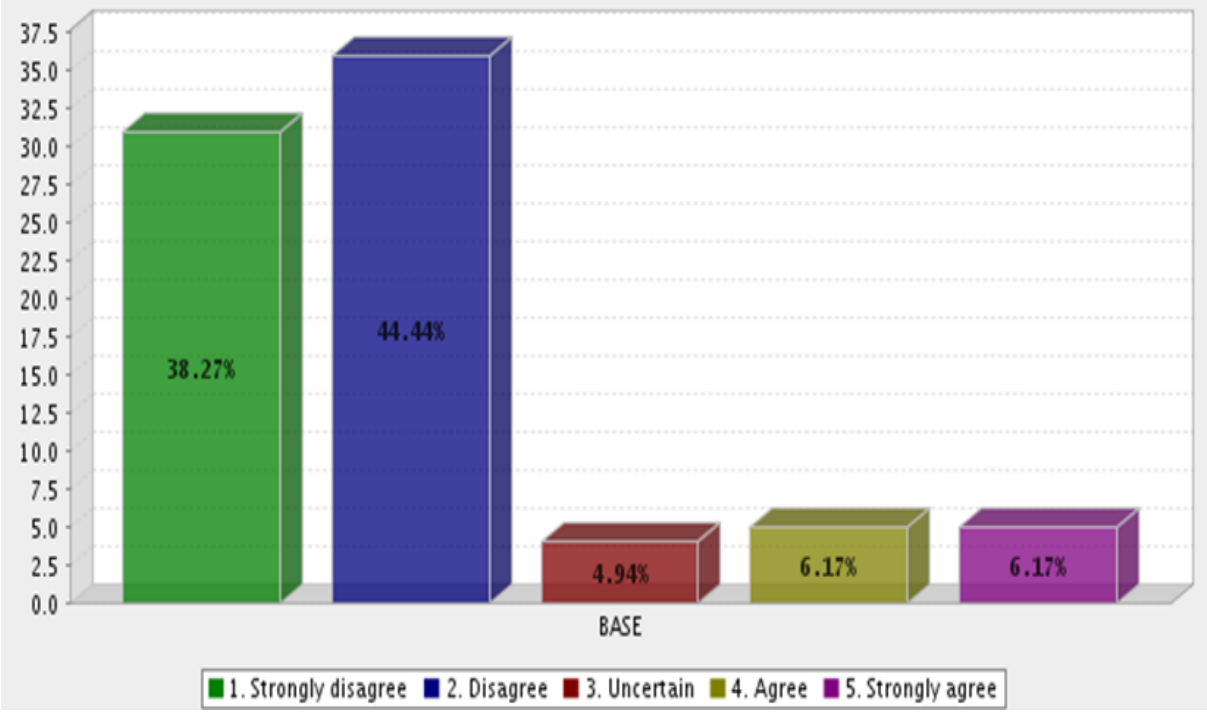


Figure 16 shows that 28.40% of respondents agreed with the statement and 18.52% of respondents strongly agreed. 25.9.3% of respondents disagreed and 20.99% strongly disagreed. There is almost a balance between respondents who agreed and those who disagreed that men are more dominant at work.

Figure 16. Men are more dominant at work as compared to women

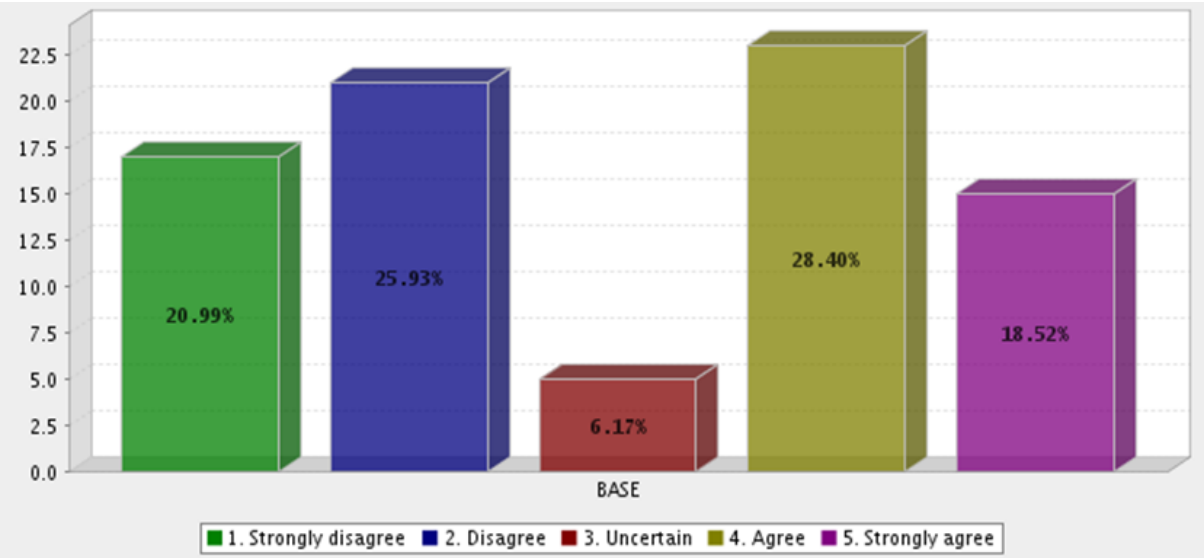


Figure 17 shows that 35.37% of respondents disagreed with the statement and 13.41% strongly disagreed with the statement. Some 26.83% agreed with the statement and 14.63% of respondents strongly agreed. 9.76% of respondents were uncertain. Women responses show that they almost disagreed with the statement that leadership does not take women seriously.

Figure 17. I sometimes feel that because of my gender I am not taken seriously by leadership

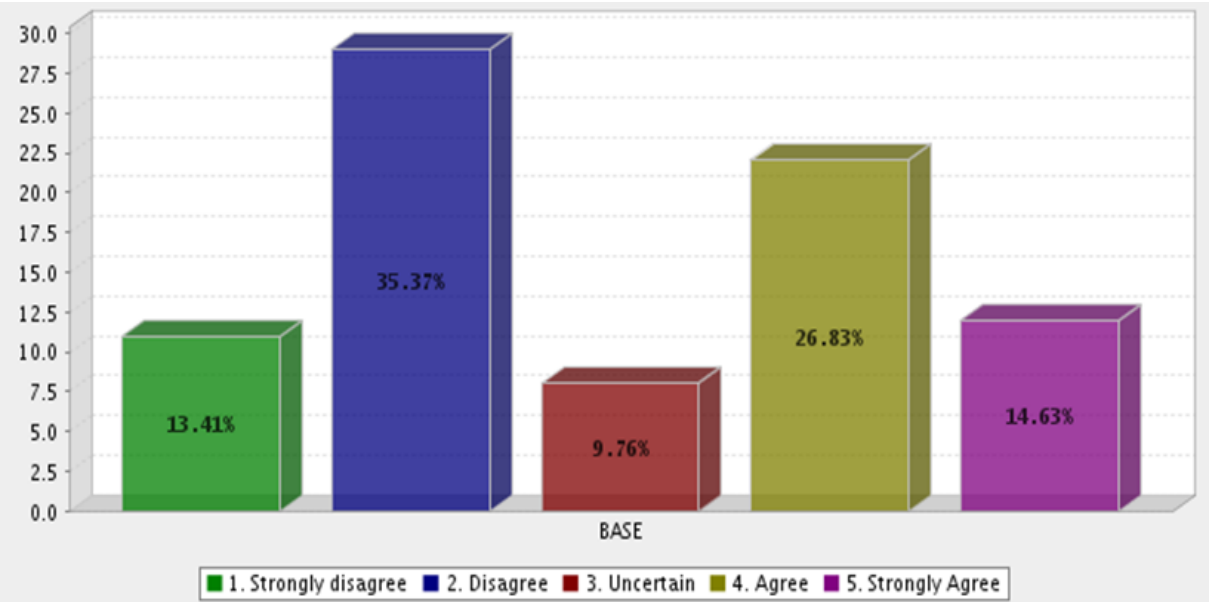


Figure 18 shows that 41.98% and 16.05% of respondents disagree and strongly disagree with the statement respectively. 20.99% and 14.81% of respondents agree and strongly agree respectively. 6.17% of respondents were uncertain. Women disagreed with the statement in general.

Figure 18. I sometimes feel that because of my gender I am not taken seriously by peers

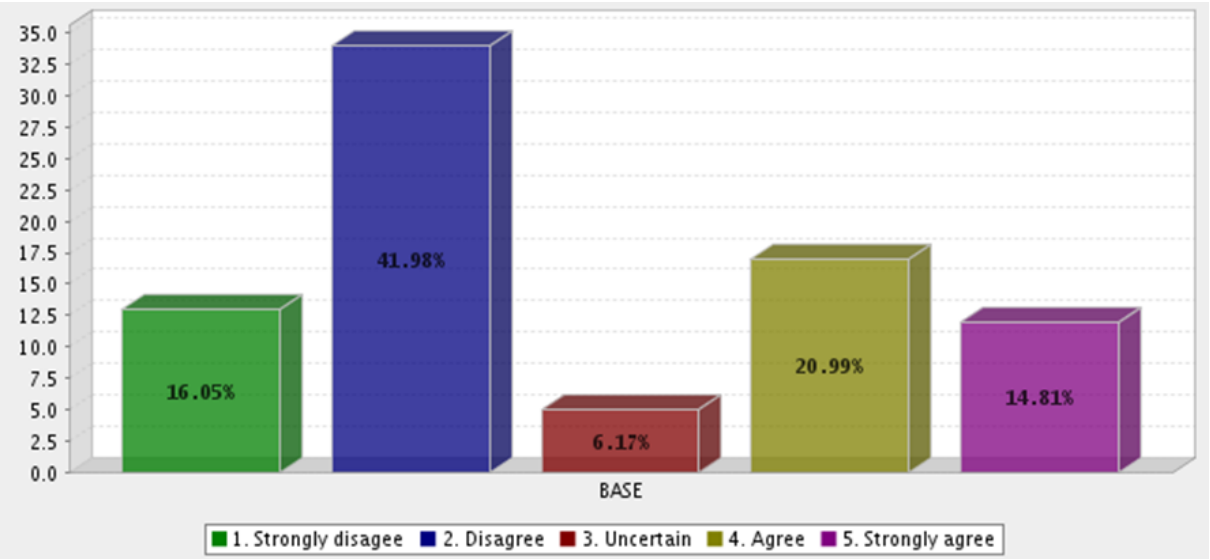


Figure 19 shows that 43.21% and 20.99% of respondents disagreed and strongly disagreed with the statement respectively. 18.52% of respondents agreed with the statement while only 7.41% of respondents strongly agreed. 9.88% of respondents were uncertain. The respondents disagreed to the statement.

Figure 19. I sometimes feel that because of my gender I am not taken seriously by subordinates

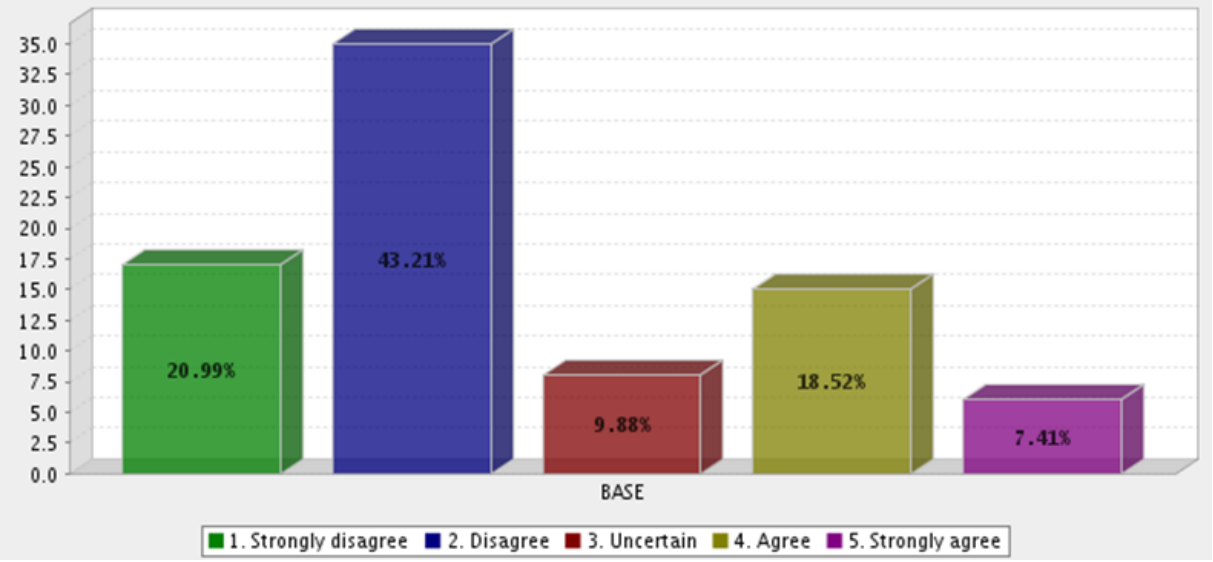


Figure 20 shows that 43.90% of respondents disagreed with the statement and 29.27% of respondents strongly disagreed. Some 6.10% of respondents agreed and 13.41% strongly Women generally disagreed with the statement.

Figure 20. As a woman I am not comfortable with giving men work instructions

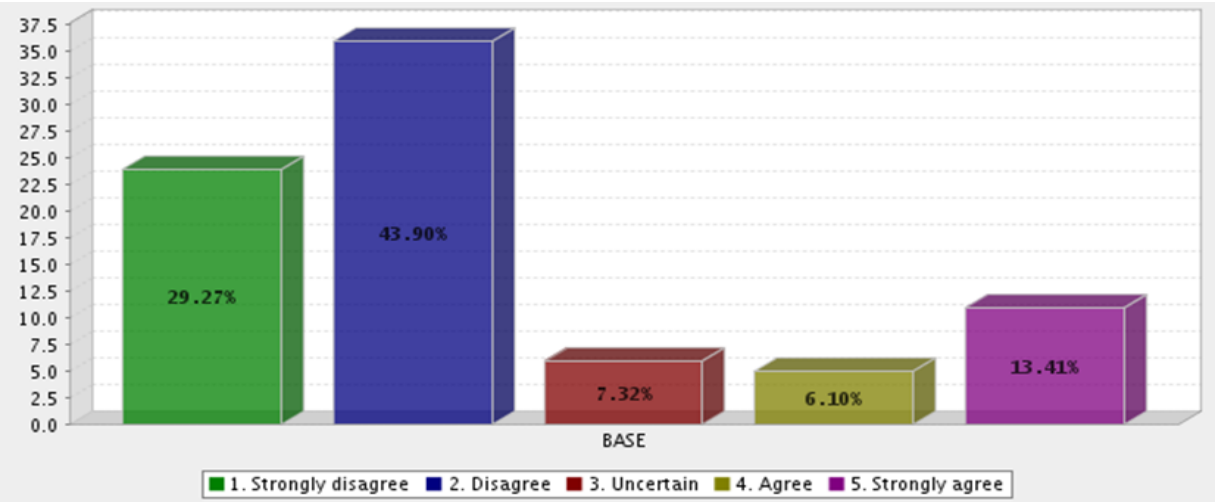


Figure 21 shows that the majority of respondents 48.75% agreed with the statement and 12.50% strongly agreed. Some 22.50% of respondents were uncertain. 7.50% of respondents disagreed and 8.75% strongly disagreed with the statement. Women generally agreed and have a perception that they are respected by their male counterparts.

Figure 21. I feel respected by male counterparts at work

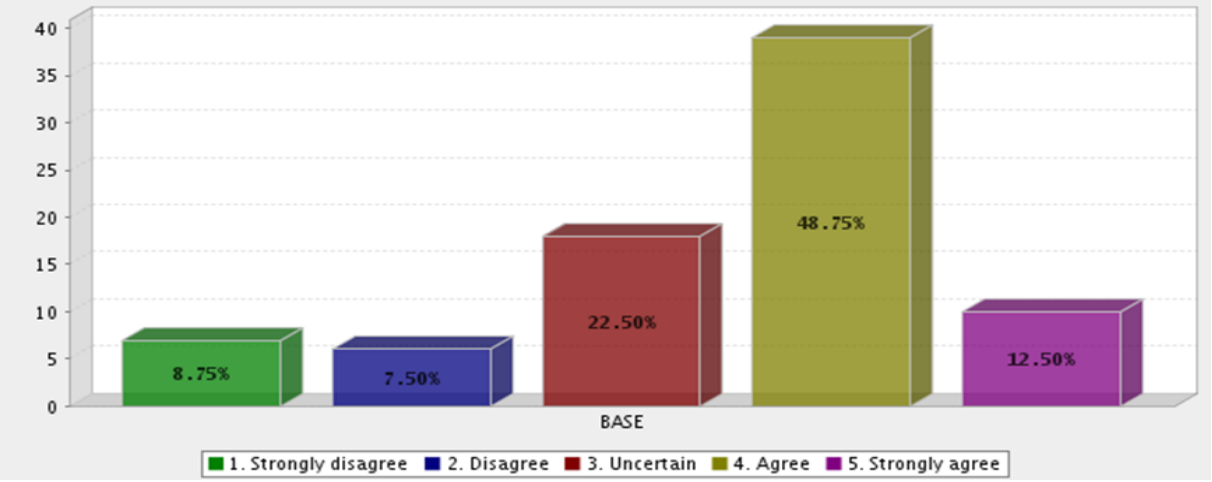


Figure 22 shows that the majority of respondents 45.00% agreed with the statement and 22.50% strongly agreed. Some 18.75% of respondents disagreed with the statement and 3.75% strongly disagreed. 10.00% of respondents were uncertain. The respondents generally felt that they commanded respect at work.

Figure 22. I command respect at work

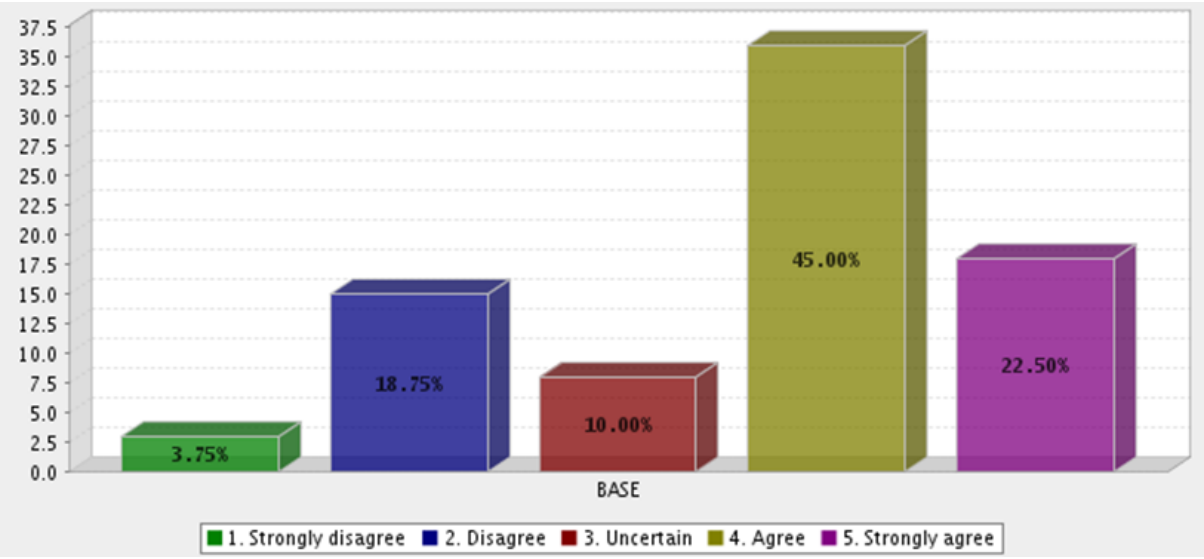


Figure 23 shows that the majority of respondents 54.32% disagreed with the statement and 22.22% strongly disagreed. 7.41% of respondents agreed with the statement and 11.11% of respondents strongly agreed with the statement. The respondents in general disagreed with the statement.

Figure 24 shows that the majority of respondents 50.00% disagreed with the statement and 14.63% strongly disagreed with the statement. Some 9.76% agreed with the statement and 13.41% strongly agreed with the statement. 12.20% of respondents were uncertain. The respondents generally disagree with the statement.

Figure 23. I do not get respect from female subordinates

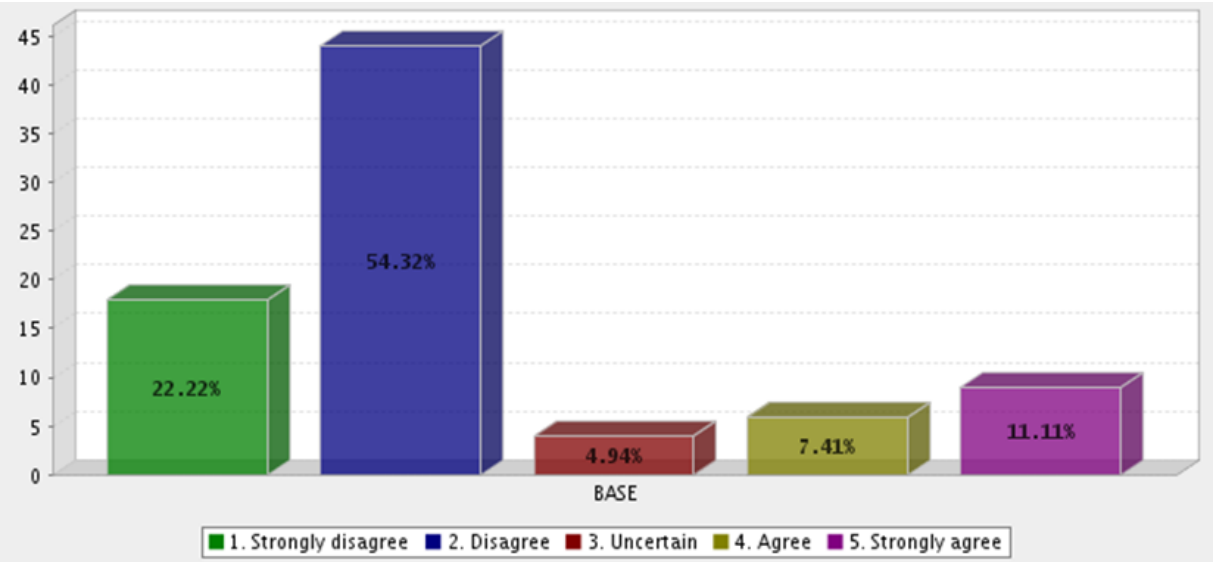


Figure 24. I do not get respect from male subordinates

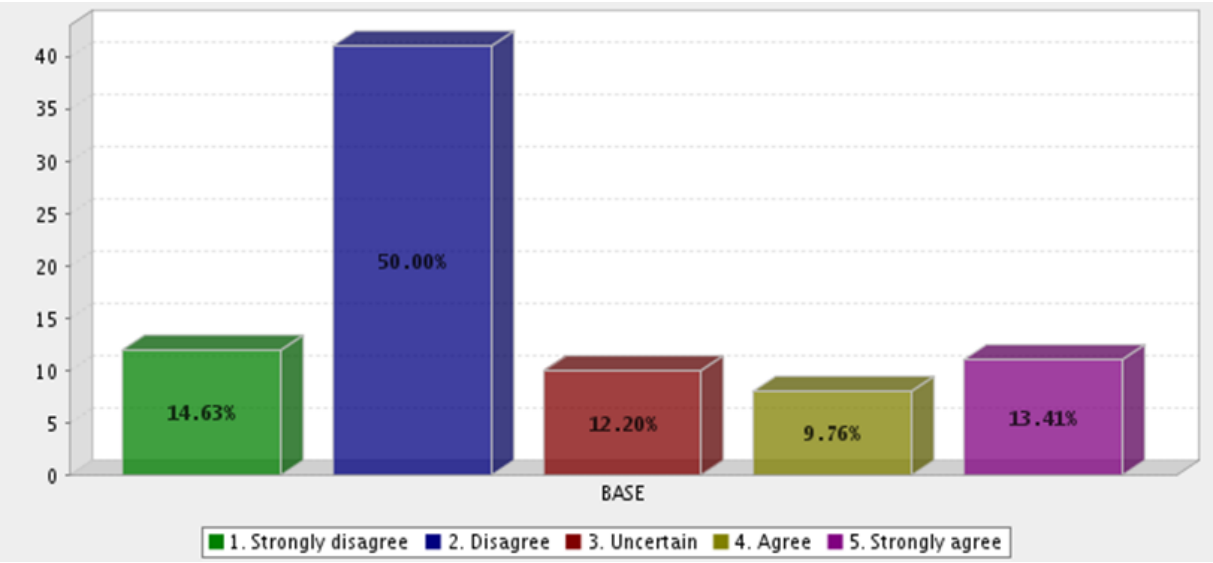


Figure 25 shows that 45.00% of respondents disagreed with the statement and 17.50% of respondents disagreed. Some 8.75% and 7.50% of respondents agreed and strongly agreed to the statement respectively. 21.25% of respondents were uncertain. Women disagreed with the statement that the Employment Equity Act is patronising to women.

Figure 25. The Employment Equity Act is patronising to women

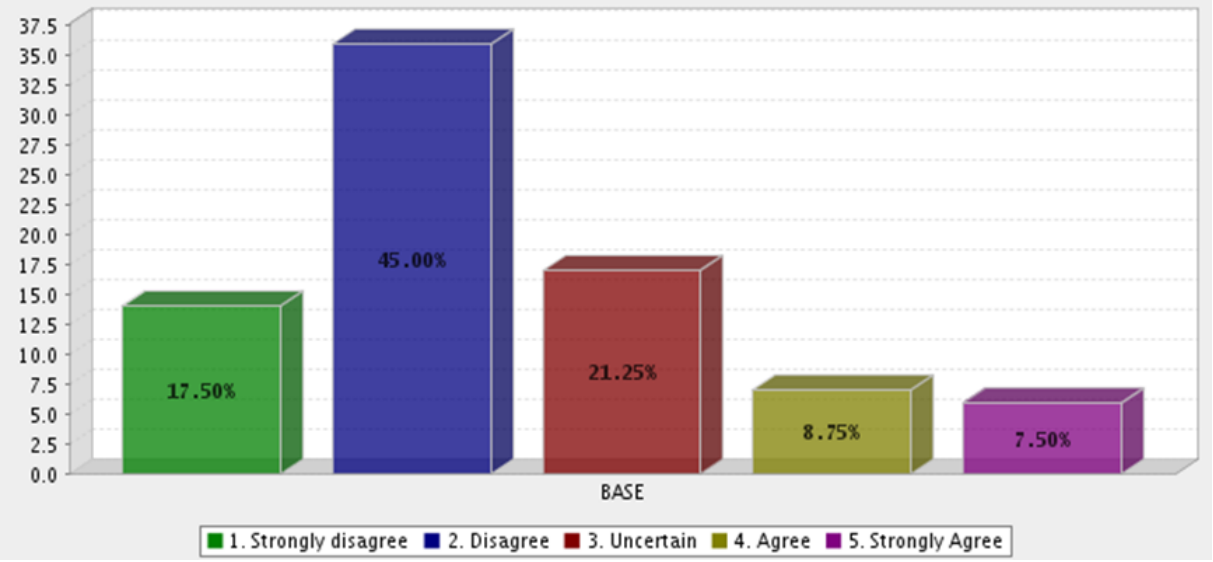
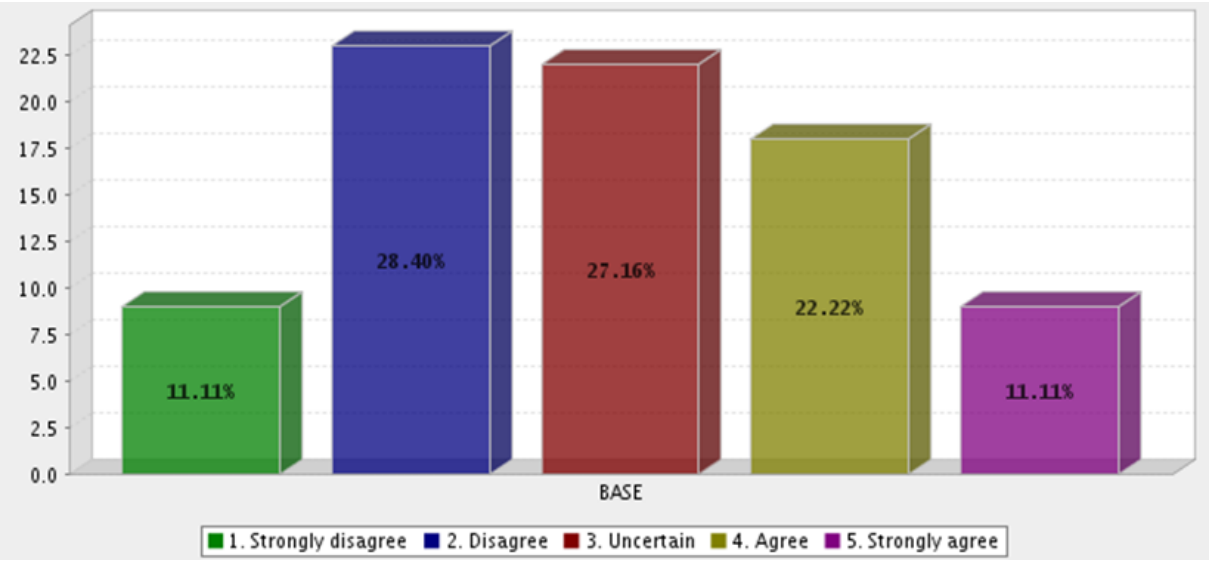


Figure 26 shows that 28.40% of respondents disagreed with the statement and 11.11% of respondents strongly disagreed with the statement. 22.22% of respondents agreed with the statement and 11.11% strongly agreed. Some 27.16% of respondents were uncertain. There was uncertainty about the statement that Employment Equity is nothing more than a window dressing.

Figure 26. Employment Equity is nothing more than window dressing



5 Conclusions and recommendations

5.1 Conclusions

Generally, the sample of women who responded to the questionnaire did not feel that they experience a glass ceiling to career advancement. The respondents leaned more on disagree and strongly disagree to statements made, that suggests that they could be experiencing barriers to career advancement. This could be attributed mainly to the transformation at the corporations at which they work as well as the positions the sampled women occupy.

About balancing family and work commitments there was a balance in the numbers of women disagreeing and those agreeing to the statements in the questionnaire. This suggests that as much as women are child bearers and family oriented, they fulfil work roles equally to their male counterparts. This also suggests that women are not willing to entertain the thought of being side-lined or overlooked for demanding and influential roles just because they are mothers.

The respondents generally felt confident in their roles and were not intimidated by male dominance at workplaces. Women, through their responses to questionnaire statements demonstrated that they were in indeed confident in their ability to fulfil work roles. The respondents also demonstrated that they were confident that senior leadership, peers and subordinates took them seriously.

The responses reflected that women are respected by male counterparts, peers and subordinates. The respondents also felt that they command respect and their professional capabilities are respected.

The respondents seemed unsure of the role of the Employment Equity Act. They did not agree with the statement that the EE Act is patronising to women, however, had mixed feelings about the role of the Act. A significant 26% of the respondents were uncertain about its function.

5.2 Recommendations

a) Women should read more and understand what the glass ceiling is and what it means.

b) Women must aim higher and not settle for less influential positions.

c) Organisations must allow women an opportunity to work on key or strategic accounts equally to men.

d) Child-bearing women must be given space to attend to their children without a fear of losing key occupations.

e) The lessons and perceptions of Durban corporate women from this research are shared nationally to promote women confidence at corporate level.

f) The lessons and perceptions of Durban corporate women from this research are shared nationally to promote a culture of workplace respect specifically gender based respect.

g) Women associations and forums such as BWA, coach women on workplace transformation with the view to educate on the transformation charter and the South African quota system.

h) Women should understand the role and objectives of the EE Act.

i) Women should not be content with accepting meaningless senior appointments. They should rather accept appointments of strategic value to the organisation where there is a likelihood of exerting impact in the organisation.

5.3 Recommendations for future research

- Future research should use probability sampling methods so that the outcomes of such research are more trustworthy and may be used with greater precision in generalising the findings to the whole population of corporate women.
- Although the research included executive and board members of corporations, the responses were not forthcoming. Future research should include other cities such as Johannesburg and Cape Town since corporate leaders are usually based at the headquarters.
- Mixed study is encouraged as it accommodates qualitative techniques to compliment this quantitative one.

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POLICY BURDENS OF DEVELOPMENT BANKS: EVIDENCE FROM INDONESIA

Hasan Almutahar*, Muhammad Agung Prabowo**, Tulus Haryono**, Asri Laksmi Riani**, Irwan Trinugroho**

Abstract

We take the social or development perspective of government banks on the Indonesian regional development banks. We find that those banks have more employee burden and small scale loans burden than other banks. Excessive employment in the regional development banks is positively associated with the degree of poverty in their regions and negatively related to the regional economic capacity. In the regions with high degree of poverty, those banks have to channel excessive small scale loans.

Keywords: Regional Development Banks, Policy Burdens, Employee Burden, Small-Scale Loans, Regional Economic

**Faculty of Social and Political Sciences, Universitas Tanjungpura, Indonesia, Jl. Prof. Dr. H. Hadari Nawawi, Pontianak, Indonesia*
***Faculty of Economics and Business, Universitas Sebelas Maret, Indonesia, Jl. Ir. Sutami 36A, Surakarta 57126, Indonesia*

1 Introduction

The grabbing hand theory contends that state-owned enterprises may perform inefficiently because they are subject to politicians and bureaucrats (Shleifer and Vishny, 1994, 1998). Focusing on state-owned banks (government banks), there are two main theories related to those banks based on such two opposing theories. According to the social or development theories, state-owned banks are often inefficient because they play a role as agent of development. Sometimes they are assigned to fund unprofitable investments. The political theory of government ownership of banks explains that state-owned banks are less profitable because they have to serve the interest of politicians (La Porta *et al*., 2002), particularly through their lending behavior (Sapienza, 2004; Dinc, 2005; Micco *et al*., 2007).

This study is aimed at examining the social or development view of state-owned banks on the Indonesian regional development banks (henceforth RDBs), the banks which are owned by regional government[2]. A regional development bank in Indonesia commonly is the largest firm controlled by a regional/provincial government. To examine this theory, we have to identify and disentangle the channel of social and development activities of such banks. We consider two following policy burdens of the RDBs. First, we argue that the RDBs are assigned to help reduce the unemployment by recruiting more employees than the industry average or surplus labor (Bai *et al*., 2006; Liao *et al*. 2009; Wu *et al*., 2010, Prabowo *et al*., 2014). Second, we contend that the other policy burden comes from the fact that RDBs have to conduct development activities through granting small scale loan more than the industry average. Those banks have to channel more loans to micro and small enterprises which tend to be risky.

To confirm the social or development view of the Indonesian RDBs, we first investigate whether those banks have more policy burdens than other banks. Second, we go further by examining the impact of regional economies where the RDBs located on the policy burdens of those banks. Supposedly, in the less developed regions, the degree of policy burdens is higher than in the developed regions.

2 Methodology and data

We consider two measures of policy burdens which are employee burden and small scale loans burden. We follow the logic to calculate the employee burden as used by Bai *et al*. (2006), Liao *et al*. (2009), Wu *et al*. (2010), Prabowo et al. (2014). However, we use salary cost (personnel cost) instead of number of employees. The formulation of employee burden is as follows:

[2] State-owned (government) banks in Indonesia consist of state-owned banks (*bank BUMN/Persero*) which are controlled by central government and regional development banks (*Bank pembangunan Daerah/BPD*) which are owned by regional government. Currently, there are 4 state-owned banks and 26 regional development banks.

$$Employee\ burden = \left(Salary\ cost - Industry\ average\ on\ salary\ cost * \frac{Income}{Industry\ income}\right) / Salary\ cost$$

We introduce small scale loans burden which is the excess small scale loans that should be released by the RDBs compare to the industry average. Therefore, the method to measure the small scale loans burden can be seen in this following formula:

Small scale loans burden = (Small scale loans to total loans) – (Industry average on small scale loans to total loans)

109 commercial banks which consist of state-owned banks, regional development banks, foreign banks, and domestic-private banks are used to reflect the industry.

First, we examine whether the RDBs have more policy burdens than other banks. We use data from 2001-2010. We control for several variables which are dummy foreign banks (FOB), dummy listed banks (LISTED), natural log of total assets (LNTA), and the ratio of equity to total assets (EQTA) following the work of Prabowo et al. (2014). The equation can be written as:

$$Policy\ burdens_{i,t} = \alpha_0 + \alpha_1 RDB_{i,t} + \alpha_2 FOB_{,t} + \alpha_3 Listed_i + \alpha_4 LNTA_{i,t} + \alpha_4 EQTA_{i,t} + \varepsilon_{i,t} \quad (1)$$

Second, we deepen our study by looking the effect of regional economies on policy burdens of the RDBs. We use two proxies of the regional economies. The degree of poverty (POVERTY) could be considered to reflect the social condition as well as the development of the regions. Then, the proportion of a region's GDP to country's GDP (REG GDP) represents the economic capacity of the region. Two control variables are performed in the empirical model. First, we take into account dummy of regional development banks which are located in the Java Island (JAVA). Java is the most populous island and could be considered as the most developed island in Indonesia. Second, we include a bank specific variable which is the ratio of equity to total assets (EQTA). We exclude bank size (total assets) because it has high correlation with the proportion of regions' GDP to country's GDP. There is only one publicly traded regional development bank and just listed since 2010, therefore we do not incorporate dummy for listed bank.

To test the impact of regional economies on policy burdens, we then write the specification of the empirical model in the equation 2. We use panel least square with time-fixed effect to estimate this empirical model.

$$Policy\ burdens_{i,t} = \alpha_0 + \alpha_1 Poverty_{i,t} + \alpha_2 Regional\ GDP_{i,t} + \alpha_3 Java_i + \alpha_4 EQTA_{i,t} + \varepsilon_{i,t} \quad (2)$$

Banks' financial statements over the periods 2001-2010 come from Bank Indonesia (the Indonesian Central Bank) and Ekofin Konsultindo. These financial statements also provide us with the information on small scale loans. Data on the regional economies are obtained from Indonesia Statistics Bureau (BPS). However, the regional economies data are only available for 2007-2010.

The statistics on policy burdens of RDBs and non-RDBs are reported in the appendix. The descriptive statistics and correlations of all variables used in the second empirical model are presented in the appendix as well.

3 Regression results

The results which are presented in the Table 1 obviously show that the RDBs have more employee burden and small scale loan burden than other banks. Then, the negative and significant coefficients of FOB, LISTED, and LNTA indicate that foreign banks, listed banks, and large banks have lower employee burden and small scale loans burden than domestic banks, non-listed banks, and small banks, respectively.

We then examine the impact of regional economies on policy burdens of Indonesian RDBs. Column 1-3 of Table 2 presents the regression results of the impact of regional economy variables and control variables on employee burden. Consistent with what we expect, the result suggests that the employee burden of RDBs is higher in the regions with high levels of poverty. Then, the coefficient of proportion of regional's GDP to country's GDP (REG GDP) has a negative and significant sign on employee burden. This may be attributed to the fact that economically small regions have less developed private sectors, less formal employment and finding jobs is difficult. To help reduce unemployment, regional development banks are assigned to absorb the excess workforce. The positive and significant coefficient of RDBs located in the Java Island on employee burden is supposedly caused by the high population in this island which may correlate with high degree of unemployment. The ratio of equity to assets has negative and significant effect on employee burden.

Table 1. Regressions results (all banks: 2001-2010)

	EMPLOYEE BURDEN		SMALL SCALE LOANS BURDEN	
	1	2	3	4
CONSTANT	1.121***	1.102***	0.161**	0.134**
	(0.213)	(0.197)	(0.068)	(0.063)
RDB	0.208***	0.211***	0.138***	0.138***
	(0.052)	(0.052)	(0.016)	(0.016)
FOB	-0.443***	-0.443***	-0.188***	-0.191***
	(0.055)	(0.055)	(0.018)	(0.017)
LISTED	-0.298***	-0.295***	-0.072***	-0.074***
	(0.068)	(0.068)	(0.022)	(0.022)
LNTA	-0.069***	-0.068***	-0.009**	-0.007*
	(0.014)	(0.013)	(0.004)	(0.004)
EQTA	-0.003	-0.002	-0.0002	-0.00004
	(0.002)	(0.002)	(0.0007)	(0.0006)
Time fixed effect	Yes	No	Yes	No
Number of banks	109	109	109	109
Observations	1046	1046	1042	1042
Adj-R^2	0.22	0.22	0.28	0.28

Note: The value in the parentheses is standard error. ∗, ∗∗ and *** indicate significance at the 10%, 5%, and 1% levels, respectively

The regression results of the explanatory variables on small scale loans burden are found in the column 4-6 of Table 2. The result indicates that the percentage of poverty in the regions positively impact on small scale loans burden of RDBs. Such banks have to help in the access to financing for a large number of micro enterprises, home industries, and other informal sectors which are prevalent in the less developed regions. The insignificant result of regional GDP on small loans burden could be interpreted that RDBs release small scale loans more than the average of industry even in the economically large regions. Further, we do not find evidence on the effect of our two control variables on small scale loans burden.

Table 2. Regression Results (Regional development banks: 2007-2010)

	EMPLOYEE BURDEN			SMALL SCALE LOANS BURDEN		
	1	2	3	4	5	6
CONSTANT	0.223**	0.546***	0.416***	-0.149	-0.001	-0.199*
	(0.101)	(0.092)	(0.101)	(0.099)	(0.102)	(0.108)
POVERTY	0.012***		0.008***	0.011***		0.012***
	(0.003)		(0.003)	(0.003)		(0.003)
REG GDP		-0.039***	-0.033***		-0.0006	0.009
		(0.007)	(0.007)		(0.008)	(0.008)
JAVA	0.019	0.365***	0.325***	0.015	-0.001	-0.064
	(0.063)	(0.089)	(0.088)	(0.062)	(0.099)	(0.094)
EQTA	-0.019**	-0.023***	-0.024***	0.006	0.009	0.008
	(0.008)	(0.007)	(0.007)	(0.007)	(0.008)	(0.008)
Time fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Number of RDBs	26	26	26	26	26	26
Observations	104	104	104	101	101	101
Adj-R^2	0.13	0.23	0.28	0.09	0.02	0.10

Note: The value in the parentheses is standard error. ∗, ∗∗ and *** indicate significance at the 10%, 5%, and 1% levels, respectively

4 Conclusion

This research note shows that Indonesian regional development banks serve the development purposes as indicated by the high degree of employee burden and small scale loans burden compare to other banks. We also conclude that regional economies contribute to determine the policy burdens that should be borne by those banks. First, we find that the degree of poverty positively associated with the employee burden. Second, we document that the degree of employee burden are also affected by the regional economic capacity. As expected, in the economically small regions, the degree of employee burden of those banks is high. Third, the results conclude that RDBs are burdened to channel more small scale loans

particularly in the less developed regions which are reflected by high degree of poverty. Overall, our findings confirm that regional development banks in Indonesia as a kind of government banks play roles as agent of development in which such banks are assigned to conduct development and social activities. Such developmental roles may make banks unprofitable and may lead to inefficiency.

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Appendix A

Table A1. Descriptive statistics on policy burdens (all banks: 2001-2010)

	Banks	Obs	Mean	Median	Max	Min	Std. Dev.
Regional Development Banks (RDBs)							
EMPLOYEE BURDEN	26	257	0.2700	0.3113	0.7015	-1.1308	0.2652
SMALL LOANS BURDEN	26	257	0.1594	0.0408	0.8812	-0.2752	0.2830
Other Banks							
EMPLOYEE BURDEN	83	791	-0.1449	0.0487	0.8190	-4.0375	0.7089
SMALL LOANS BURDEN	83	791	-0.0522	-0.1096	0.7807	-0.2752	0.1760

Table A2. Descriptive statistics and correlations (Regional development banks: 2007-2010)

	Mean	St. Dev	1	2	3	4	5
1.EMPLOYEE BURDEN	0.213	0.266	1				
2. SMALL LOANS BURDEN	0.102	0.254	0.125	1			
3. POVERTY (%)	15.749	8.013	0.318	0.343	1		
4. REGGDP (%)	3.804	5.070	-0.260	-0.046	-0.304	1	
5. EQTA (%)	11.102	3.357	-0.165	0.147	0.088	-0.267	1

TOPICS TO BE INCLUDED IN A MEANINGFUL AND INFORMATIVE UNDERGRADUATE BUSINESS ETHICS COURSE FOR ACCOUNTANCY STUDENTS: A SOUTH AFRICAN PERSPECTIVE

Nandi Lubbe*, Dave Lubbe*

Abstract

Unethical business practices in South Africa, as in many other countries, is at the order of the day. As a result there is increasing pressure on the auditing and accounting professions to devote sufficient attention to business education during the training of prospective auditors and accountants. This is the second in a series of two articles regarding topics that should be included in a meaningful and informative business ethics course for undergraduate students in the fields of accounting and auditing.

Keywords: Business Ethics, Accountancy, South Africa

**University of the Free State (UFS), Bloemfontein, South Africa*

1 Introduction

In the previous article to this series (refer to Lubbe & Lubbe, 2015b) the background to and purpose with the series are discussed. In the named article, reference is also made to nineteen topics that should be included in a meaningful and informative business ethics course for undergraduate students in the fields of accounting and auditing. It is also mentioned that the research findings form part of the results of an extensive study done on business ethics as an undergraduate course for accountancy students in South Africa (performed in fulfilment of a master's degree (Lubbe, 2013) in auditing).

As indicated in the introduction to the first article in the series (refer to Lubbe & Lubbe, 2015b, p. xxx), it is by no means the purpose of the two articles to provide a complete and inexhaustible list of topics to be included in a business ethics course, nor is the objective to discuss each of the nineteen topics in detail. Rather, there will only be briefly referred to the topics that, from the study (Lubbe, 2013) performed as discussed above stood out as having contributed the most to students' ethical reasoning for the purposes of developing or evaluating a business ethics course. The following ten topics will subsequently be briefly addressed in this article:

1. Promoting and improving an organisation's ethical culture
2. Whistle-blowing
3. Environmental and sustainability issues
4. Creative accounting, earnings management and the financial numbers game
5. Codes of conduct
6. International trade
7. Ethical decision-making
8. Increasing ethical awareness
9. Ethical theories
10. A few diverse ethically related topics

2 A brief overview of the suggested topics to be included in a business ethics course

2.1 Promoting and improving an organisation's ethical culture

The owners and management of an organisation can take certain measures to prevent "the barrel going bad" (for a detailed explanation on this metaphor, refer to section 2.9 in Lubbe & Lubbe, 2015b, p. xxx) and to promote and improve the organisation's ethical culture. Following, is firstly a table (table 1) that compares effective actions with ineffective actions that owners and managers can take to promote ethics in an organisation, followed by seven steps to follow to implement and run an effective ethics programme, and lastly schematic representation 1 of practices owners and managers can implement to improve an organisation's ethical culture.

Table 1. Effective versus ineffective means of promoting ethics in an organisation

EFFECTIVE	INEFFECTIVE
Establishing solid and specific ethical standards for business to follow	Establishing vague ethical standards that may be hard to interpret
Creating a comfortable ethical environment for employees	Failing to familiarize employees with standards specific to the industry
Providing training in organizational ethics for all employees	Limiting organizational ethics training to certain employees
Making one's ethics systems known to consumers	Assuming that employees will always apply one's ethical standards

Source: Ferrell & Ferrell, 2009, p. 15 - adapted

Just as is the case for many other aspects of operating a business, ethics should also be managed properly. The term ethics is a comprehensive concept and managing ethics consists of various facets. According to Ferrell and Ferrell (2009, p. 43), the following seven steps represents a brief summary of an effective ethics programme:

1. Assessing risks and putting in place standards and codes of ethical conduct.
2. Providing high-level managerial oversight to ensure compliance with these standards (for example, the appointment of a dedicated ethics officer).
3. Taking due care not to place individuals with a propensity to engage in misconduct in a position of an authority where they can influence others.
4. Using training programmes to communicate the agreed standards to all employees.
5. Establishing systems to monitor conduct and allow employees to report abuses.
6. Enforcing standards, rewards, and punishments consistently across the company.
7. Constantly reviewing the system, and taking steps to revise and improve the way it works.

Carroll and Buchholtz (2006, p. 233) also contends with the above and by means of a schematic representation (Figure 1) indicating eleven actions that play a role in the implementation and maintenance of an entity's ethical culture. The imperative role that management and directors play in the implementation and maintenance of an entity's ethical culture is emphasised by the sections of the radial, converging in the midpoint named "top management leadership".

Figure 1. Practices owners and managers can implement to improve an organisation's ethical culture

Source: Carroll & Buchholtz, 2006, p. 233 – adapted

2.2 Whistle-blowing

To "blow the whistle" means to report illegal practices (or practices that are not in line with the organisations code of conduct). In the case of an organisation, the person blowing the whistle is usually an "insider" (a person closely associated with the organisation), e.g. an employee or manager, that are aware of these practices and decides to report it.

It is often very difficult for persons to bring to light possible misdeeds of others. It may be inherent to the "uninvolved" mentality of society. It is easier for people not to get involved in situations that may involve complications, such as for instance housebreaks and accidents. Also, the danger involved in, for instance, exposing syndicate activities discourages people to get involved. If the governing framework in a country is strong and effective, it may create a meaningful, safe alternative to silence for a potential whistle-blower (Martin, 2010, p. 5; Winfield, et al., 2014, p. 255 - 261).

"Whistle-blowing" mechanisms is also one of the practices that owners/managers can implement to improve an organisation's governance and ethical culture as mentioned in Figure 1. The main motive behind blowing the whistle should be to act in the best interest of both the entity/institution and the public (refer to Figure 2 on traditional versus emerging views of employee responsibility in a potential whistle-blowing situation).

The public usually becomes aware of the accusations/crimes perpetrated by means of media reports on whistle-blowing cases. Determining whether or not to blow the whistle would be in the best interest of all involved parties may be a complicated matter. This is clearly illustrated in the respective controversial international and national cases of the media organization Wikileaks and its founder, Julian Assange, which are stirring international debate on media freedom, transparency, whistleblowing and the beneficial versus the harmful effects of disclosing confidential information, as well as the proposed South African Protection of State Information Bill (Hood, 2011, p. 635; Fenster, 2011, p. ii; SAPA, 2014).

Blowing the whistle may lead to detrimental consequences for the whistle-blower. This is one of the reasons the potential whistle blower should first carefully overthink and consider whether blowing the whistle is the "right" and "best" thing to do. A checklist to follow before blowing the whistle, according to Carroll and Buchholtz (2006, p. 523 - adapted), is subsequently provided:

1. Is there any alternative to blowing the whistle? Make sure you have tried to remedy the problem by reporting up the normal chain of command and have had no success.

2. Does the proposed disclosure advance public interest rather than personal or political gain? Do not act out of frustration or because you feel mistreated.

3. Have you thought about the outcomes of blowing the whistle for yourself and your family? Be prepared for the possibility of disapproval from friends, family and fellow workers.

4. Have you identified the source of support both inside and outside the organization on which you can rely during the process? Make sure you know your legal rights and have enlisted the help of others.

5. Do you have enough evidence to support your claim? Even more evidence is needed if you plan to remain anonymous.

6. Have you identified and copied all supporting records before drawing suspicion to your concerns? Remember to keep a factual log both before and after blowing the whistle.

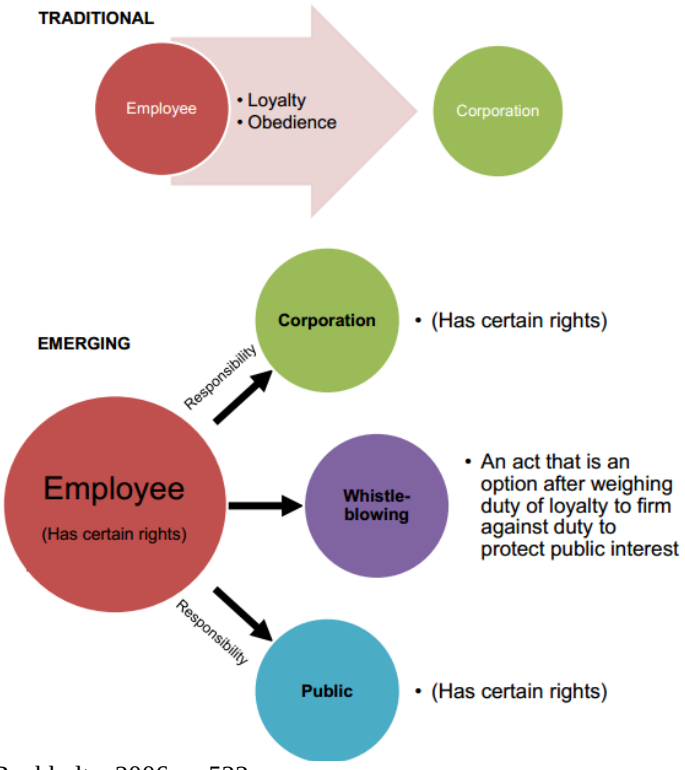
An uninformed whistle-blower may even endanger his own life or, for instance, be accused of defamation or unprofessional conduct. In light of the above it is necessary that the curriculum on business ethics devotes a degree of attention to whistle-blowing. Against this background, Figure 2 focuses especially on the responsibilities and rights of a whistle-blower.

2.3 Environmental and sustainability issues

Consumerism, rising living standards, a global culture of "instant gratification" and an increase in the world population are all contributing factors that have put immense pressure on the earth's natural resources since the twentieth century. During the last few decades, public discourse on conservation and sustainable development, increased in proportion to the seriousness of problems such as global warming (refer to Figure 3 for examples of similar problems). However, many people and organisations (especially the worst culprits contributing to such problems) initially denied the existence of relationships between occurrences such as global warming/climate change and exploitative actions - such as increasing greenhouse gas emissions. An environmental matter that has been heavily debated in South Africa for the last few years is the possible exploiting of shale gas in the Karoo by means of hydraulic fracturing, commonly known as "fracking" (Vecchiatto, 2012; SAPA, 2012; Mutheiwana, 2011; Davis, 2012; Lubbe, 2013, p. 46).

One of the three elements that an entity should report on, according to the principle of triple bottom-line reporting (refer to section 2.5 in Lubbe & Lubbe, 2015b, p. xxx) is the environmental ("planet") aspect. Integrated reporting is needed to adequately report on this matter and the integrated report can e.g. include a sustainable development report. Triple-bottom line reporting, with regards to the environmental aspect, should lead to greater transparency towards the entity's stakeholders regarding how well management has a.) performed its role as stewards of the earth's natural resources, b.) governed the entity's operations regarding its environmental impact and c.) fulfilled its corporate social responsibility.

Figure 2. Two views of employee responsibility in a potential whistle-blowing situation



Source: Carroll & Buchholtz, 2006, p. 522

Part of an entity's corporate social responsibility (refer to section 2.4 in Lubbe & Lubbe, 2015b, p. xxx) is to comply with legal and ethical requirements regarding environmental issues. Entities should keep in mind that many "stakeholders" (refer to section 2.6 in Lubbe & Lubbe, 2015b, p. xxx) are affected by whether a business is operated and managed in an environmentally ethical, responsible manner or in a short-sighted, environmentally exploitative, profit-greedy manner. Subsequently, a number of sustainability issues, as presented in the authoritative SAICA publication, Green, (Terry, 2008, p. 23) are outlined in Figure 3.

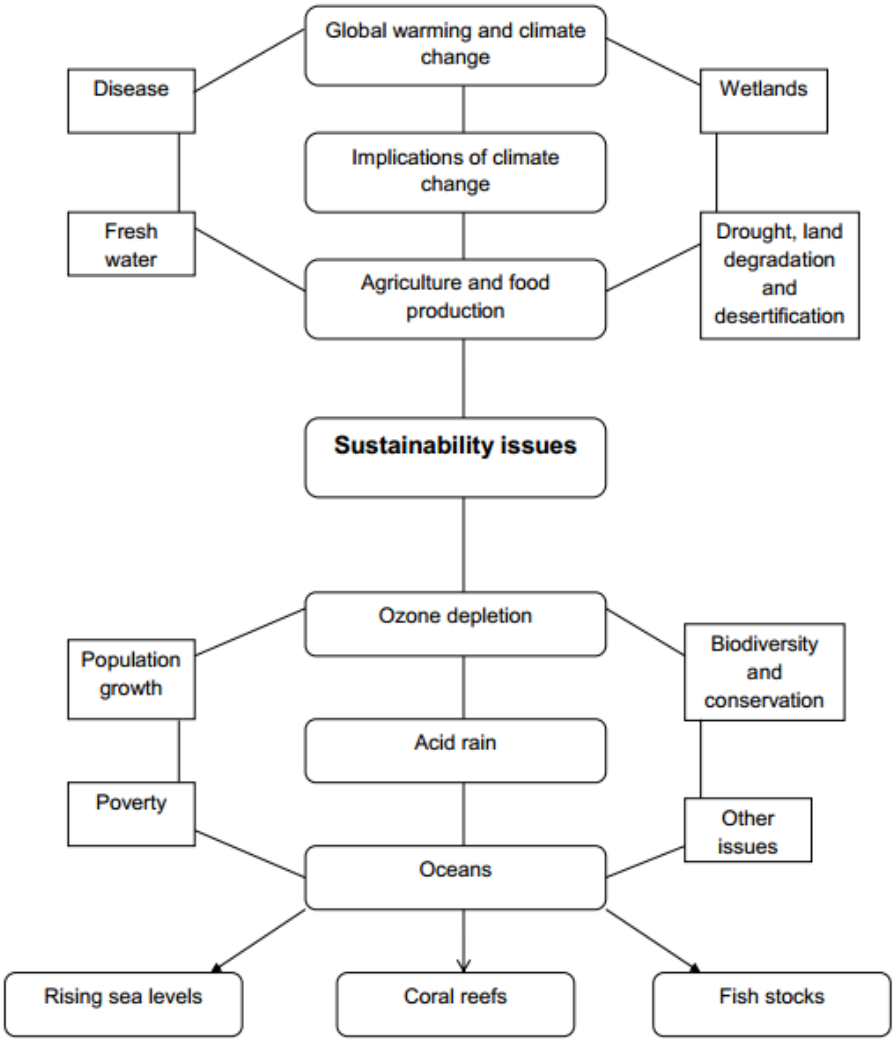
2.4 Creative accounting, earnings management and the financial numbers game

In a business ethics course, emphasis should be placed on "ethical conduct" and "unethical conduct" - such as corruption, fraud, bribery and theft, which are often used as points of discussion to make students aware of the hard, "real world" business environment of which they may find themselves a part of in the future. Although forensic auditing plays an important role in the world of accountants and auditors, explicit examples of how, for example, creative accounting and earnings management are committed, does not form part of the university education of South African chartered accountants (CAs(SA)). In auditing courses, normally only the responsibilities and standards regarding fraud and risks posed by fraud, are dealt with (SAICA, 2014a, p. 37; SAICA, 2014b, pp. 65, 82, 83 and 88). Since forensic auditing is very closely related to business ethics (especially regarding accountants and auditors) it may be appropriate to briefly touch on aspects such as creative accounting and earnings management in the syllabus of a meaningful and informative business ethics course for undergraduate students in the fields of accountancy and auditing. Following, is a number of examples on potential earnings management techniques/activities, as according to Mulford & Comiskey (2002, p. 65) which may be included in the course:

1. Changing depreciation methods, (e.g., accelerated to straight-line).
2. Changing the useful lives used for depreciation purposes.
3. Changing estimates of salvage value used for depreciation purposes.
4. Determining the allowance required for uncollectible accounts or loans receivable.
5. Determining the allowance required for warranty obligations.
6. Deciding on the valuation allowance required for deferred tax assets.
7. Determining the presence of impaired assets and any necessary loss accrual.
8. Estimating the stage of completion of percentage-of-completion contracts.
9. Estimating the likelihood of realization of contract claims.

10. Estimating write-downs required for certain investments.
11. Estimating the amount of restructuring accrual.
12. Judging the need for and the amount of inventory write-downs.
13. Estimating environmental obligation accruals.
14. Making or changing pension actuarial assumptions.
15. Determining the portion of the price of a purchase transaction to be assigned to acquire in-process research and development.
16. Determining or changing the amortization periods for intangibles.
17. Deciding the extent to which various costs such as landfill development, direct- response advertising, and software development should be capitalized.
18. Deciding on the proper hedge-classification of a financial derivative.
19. Determining whether an investment permits the exercise of significant influence over the investee company.
20. Deciding whether a decline in the market value of an investment is other than temporary.

Figure 3. Environmental sustainability issues



Source: Terry, 2008, p. 23

2.5 Codes of conduct

One of the effective means of promoting the ethical culture in an organisation that is mentioned under section 2.1, is establishing solid and specific ethical standards for a business to follow. A good way to do this is to develop and implement a code of conduct for the organisation (as is mentioned in "seven steps of an effective ethics programme" and Figure 1 titled "Practices owners and managers can implement to improve an organisation's ethical culture").

Following is a list of topics that are frequently addressed in codes of conduct (as according to Carroll and Buchholtz (2006, p. 243)):

1. Conflicts of interest
2. Receiving gifts, gratuities, entertainment

3. Protecting company proprietary information
4. Giving gifts, gratuities, entertainment
5. Discrimination
6. Sexual harassment
7. Kickbacks
8. General conduct
9. Employee theft
10. Proper use of company assets

Many times in the first article of this series (refer to Lubbe & Lubbe, 2015b), reference is made to the influence that aspects such as culture, tradition and religious convictions can have on a person's ethical views. One of the aspects that often forms part of ethical codes, as set out above in the topics provided by Carroll and Buchholtz (2006, p. 243), is the giving and receiving of gifts. The following is a brief summary of four different regions' views on giving and receiving gifts, as according to Ferrell and Ferrell (2009, p. 17):

Table 2. Different cultural attitudes toward gift giving

Region	Attitude
Latin America	Gifts should be given during social encounters, not in the course of business.
China	Gifts should be presented privately, with the exception of collective ceremonial gifts at banquets.
Europe	Do not risk the impression of bribery by spending too much on a gift.
Arab World	Do not give a gift when you first meet someone; it may be interpreted as a bribe.

Source: Ferrell & Ferrell, 2009, p. 17 - adapted

To receive a gift of a significant nature and/or value, offered with the intent to bribe, poses a definitive threat to a business's integrity (Marx, et al., 2011, p. 3-28). However, one should also be able to make a distinction between a bribe and a gift presented as a courtesy in the normal course of business. To decline the latter can be seen as very offensive, especially in certain cultures.

The receiving of "gifts and hospitality" is also addressed in SAICA's Code of Professional Conduct for members of the chartered accountancy profession in South Africa, since the bribing of auditors and accountants to "overlook" or "hide" fraud is a serious matter (SAICA, 2014c, p. 32; Marx, et al., 2011, p. 3-28).

Above, the giving of gifts was briefly referred to with regard to the "culture" of four world regions. Gifts are only one of the aspects that should be included in an ethical code (see the frequently addressed topics in codes of conduct above, as according to Carroll and Buchholtz, 2006, p. 243). Each one of the other topics, such as conflicts of interest, sexual harassment and kickbacks can, similarly to gifts, be used as examples in the curriculum.

As previously stated in the article, ethics in an entity has to be managed. In the case of ethical codes that form part of a greater "ethical management system", such codes can be applied to have a positive influence on the ethical behaviour within an organisation as stated below, according to Carroll and Buchholtz (2006, pp. 243, 244):

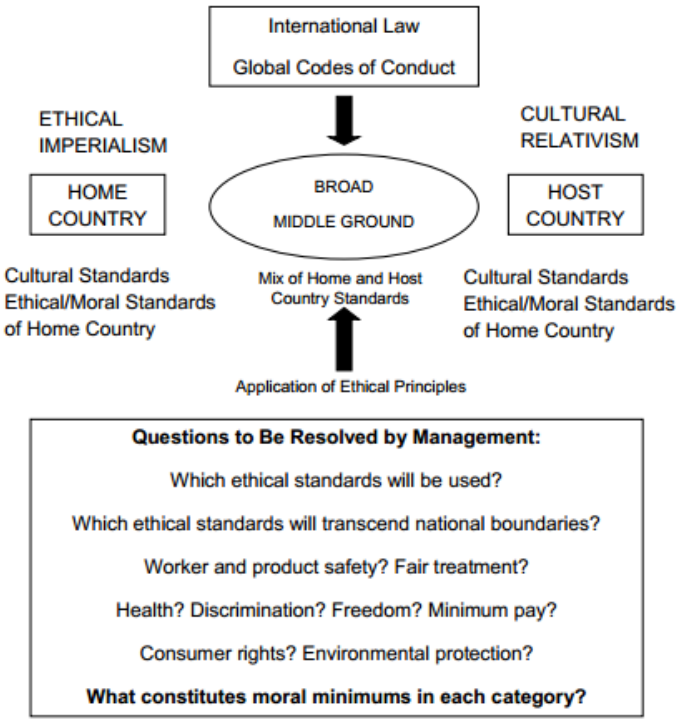
1. As a rule book, the code acts to clarify what behaviour is expected of employees.
2. As a signpost, the code can lead employees to consult other individuals or corporate policies to determine the appropriateness of behaviour.
3. As a mirror, the code provides employees with a chance to conform whether their behaviour is acceptable to the company.
4. As a magnifying glass, the code suggests a note of caution to be more careful or engage in greater reflection before acting.
5. As a shield, the code acts in a manner that allows employees to better challenge and resist unethical requests.
6. As a smoke detector, the code leads employees to contact the appropriate authority and report violations.
7. As a club, the potential enforcement of the code causes employees to comply with the code's provisions.

2.6 International trade

Globalisation, international trade and cross-country/-continental business relations are ever-increasingly prevalent due to, amongst others, technological progress. As a result of differences, in amongst others legislation, codes of conduct and the culture of businesses that are located in different regions, what is regarded as ethical may vary from business to business. If a business participates in international trade, it is important that an ethical "middle ground" be found and that the conduct of the business remains within bounds of what is regarded as ethically acceptable and legal in all countries involved. Unethical conduct in one country can lead to disastrous consequences for an entity that operates in multiple countries. Probably one of the most well-known examples is the unethical conduct of a few of the American partners of the former "big five" audit firm Arthur Andersen (refer to section 2.1 in Lubbe & Lubbe, 2015b, p. xxx, for more detail on the Enron scandal) of which the consequences soon spread and led to the demise of the firm.

Following is a Figure 4 of ethical choices in home versus host country situations, as according to Carroll & Buchholtz (2006, p. 319):

Figure 4. Ethical choices in home versus host country situations

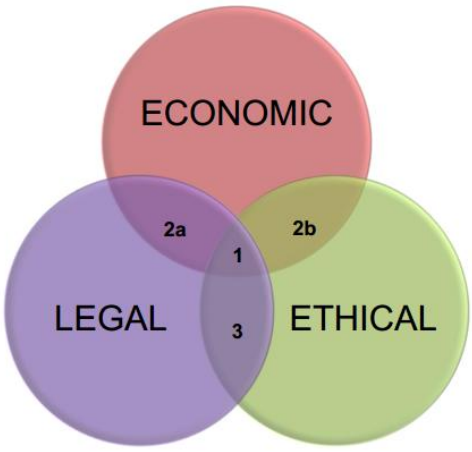


Source - Carroll & Buchholtz, 2006, p. 319 – adapted

2.7 Ethical decision-making

Various factors play a role in a "business decision". For the purposes of this article the three most important aspects that have to be considered in a "business decision" are economic matters, legal matters and ethical matters (see Figure 5). Simplistically stated the three aspects ought to intersect/"harmonise" as far as possible in the schematic representation.

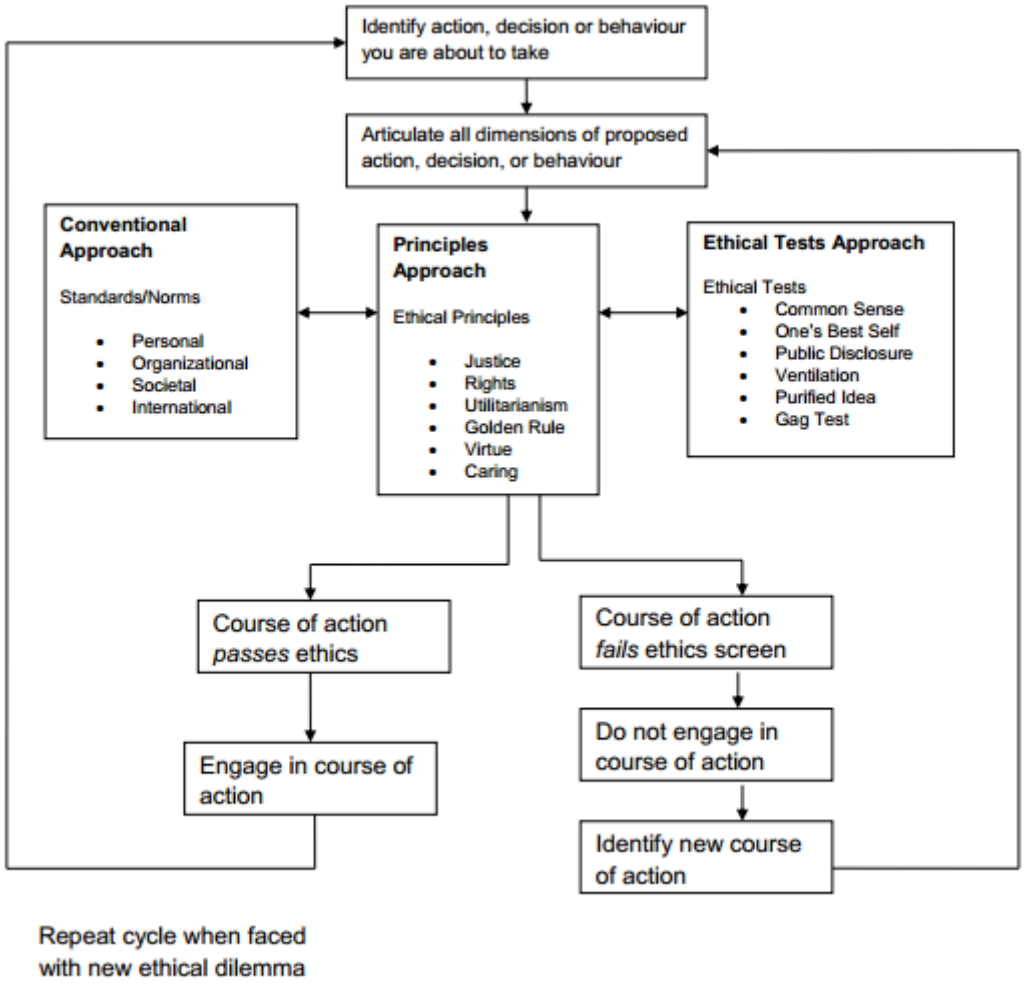
Figure 5. Ethical decision-making



Source: Carroll & Buchholtz, 2006, p. 180 - adapted

Preceding is a simplistic, but useful overview of what ethical decision-making involves. In the literature, endless suggestions of what an ethical decision-making process should involve are provided. The following Figure 6, is but one example thereof, as according to Carroll & Buchholtz (2006, p. 241):

Figure 6. A process of ethical decision-making



Source: Carroll & Buchholtz, 2006, p. 241 – adapted

2.8 Increase in ethical awareness

The question often arises as to whether or not there is an increase in the ethical awareness of the general public. A further question arises from the preceding question, being that if there is indeed an increase in ethical awareness, what the reasons for this increase are. Numerous ethical debates and answers can result from these two questions. Matters that may be responsible for the possible increase in awareness include:

- The possible positive impact that good corporate governance writings has had on the public's expectations of ethical conduct from business;
- The guard dog role that the media plays with regard to unethical conduct; and
- The public in a country such as South Africa who experiences the impact of unethical conduct such as poor municipal service delivery and decides to voice their dissatisfaction through protest (refer to Lubbe, 2013, p. 44 - 47 for more on protest in South Africa).

The well-known academics and business ethics authors, Profs Archie Carroll and Ann Buchholtz (2006, pp. 14, 174), made use of two graphs (Figures 7 and 8) in which they elucidated the increase in the "gap" over a period of 40 years (from the 1960s to the 2000s) in the "social problem" (Figure 7) and the "ethical problem" (Figure 8).

Figure 7. Society's expectations versus business' acutal "social performance"

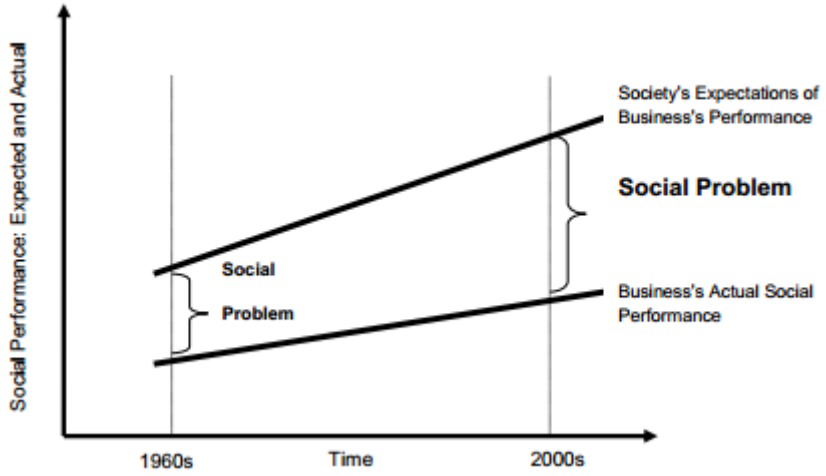
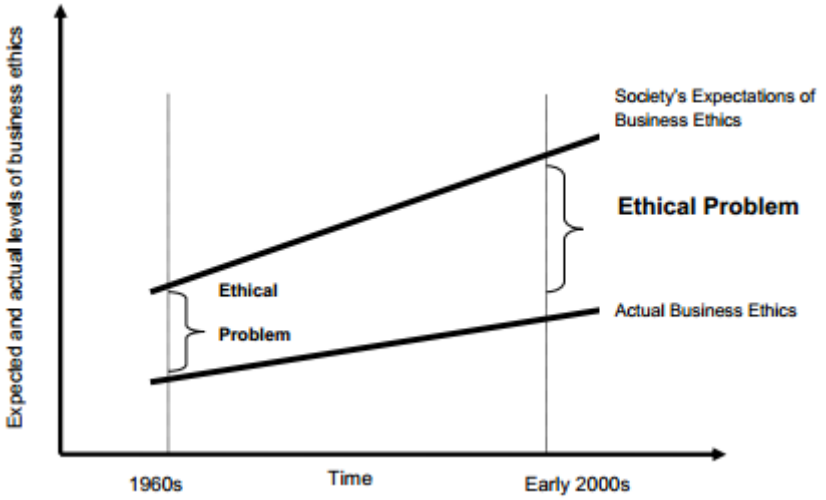


Figure 8. Business ethics today versus earlier periods



Source: Carroll & Buchholtz, 2006, p. 174 – adapted

2.9 Ethical theories

Ethical theories should form an essential part of the foundation of a business ethics course. In the handbooks of Rossouw, et al. (2010, p. 17) and Rossouw & Van Vuuren (2010, p. 4)[3] (as well as in many other good books on business ethics) important ethical theories are sufficiently discussed. For this reason, subsequently, a few of these theories will only be listed and not discussed:

- The virtue theory of Aristotle (Refer to Rossouw, et al., 2010, pp. 59-62; Rossouw & Van Vuuren, 2010, pp. 67-71)
- The deontological theory of Kant (Refer to Rossouw, et al., 2010, pp. 62-65; Rossouw & Van Vuuren, 2010, pp. 71-75)
- The utilitarian theory of Mill (Refer to Rossouw, et al., 2010, pp. 65-69; Rossouw & Van Vuuren, 2010, pp. 76-80)
- The social contract theory of Hobbes (Refer to Bowie & Schneider, 2011, pp. 53-54)
- Rawls's theory on the "Original Position" or the "Veil of Ignorance" (Refer to Rossouw & Van Vuuren, 2010, p. 22; Bowie & Schneider, 2011, pp. 54-56)
- The situational theory of Fletcher (Refer to Bowie & Schneider, 2011, p. 62)
- Egoism (Refer to Bowie & Schneider, 2011, pp. 59-60)
- Hedonism (Refer to Bowie & Schneider, 2011, p. 61)
- Welfarism (Refer to Bowie & Schneider, 2011, pp. 61 -62)

[3] These are the two handbooks that were prescribed for the four groups that were selected for the empirical section of the study performed by Lubbe (2013, pp. 198 - 298) on what the impact of courses in business ethics is on the ethical reasoning and perceptions of accountancy and business students that completed one of the four courses selected for the mentioned study.

2.10 A few diverse ethically related topics

As introduction to the first article in this series (refer to Lubbe & Lubbe, 2015b), it was mentioned that the two articles in the series will briefly deal with nineteen suggested topics that could be included in a business ethics course. Subsequently, as a conclusion to this article, a few practical matters will be referred to, that (depending on the contact time and time for class discussions during lectures), could also be used rewardingly:

- The role of the media in business ethics;
- An analyses of whether annual reports of e.g. certain listed companies or state entities contain decent, informative reporting on ethical aspects with regards to the respective entities;
- The utilisation of DDT in the battle against e.g. malaria, although DDT is in actual fact a banned substance that may cause cancer;
- The ethical implications of industries such as gambling, liquor trading, drug trading, prostitution and unregistered/unlawful short-term loan providers ("loan sharks");
- The remuneration of directors and management versus employees on "lower" levels of the entity;
- Money laundering;
- The influence of reckless taxi operators on the economy of South Africa;
- The role and actions of labour unions e.g. violent strikes;
- Whether or not all economic activities can/should be "quantifiable" in a monetary value;
- Whether or not Broad-based Black Economic Empowerment (B-BBEE) is "ethically" applied in South Africa;
- Ethical and unethical advertisements;
- The misuse of internet in the workplace for non-work purposes ;
- The ethicality of telemarketing and internet marketing methods;
- The right to privacy (especially with regards to internet related practices);
- The right to privacy of e.g. personnel, clients and stakeholders;
- The utilisation of insider information for personal gain (i.e. insider trading);
- HIV/AIDS in the workplace;
- The ethical and economic implications regarding the apartheid-like, social- religious construct of the so called "caste system" in India; and
- The practice of child labour.

3 Conclusion

For thousands of years, man has been searching for the meaning of life, especially through philosophy and religion. One of the most important aspects in the search of the meaning of life is probably man's search for what constitutes right (good) and wrong (bad). The search for what is right/good or bad/wrong has not been confined to the personal/philosophical/religious aspects of life, but also spread to the business sphere and eventually developed into the academic field, today known as business ethics.

One of the main challenges in presenting business ethics courses is to keep the subject pragmatic and practically applicable - which may be difficult, possibly due to the discipline's development from philosophy (Lubbe & Lubbe, 2015a, p. xxx). If the pragmatic and practical focus is not maintained, business ethics may result in a mere philosophical and theoretical course that has little to do with ethical challenges encountered in the real accountancy profession and business world (Lubbe & Lubbe, 2015a, p. xxx). Subsequently, in this series of two articles the focus fell on nineteen topics which should be included in a meaningful and informative business ethics course for undergraduate students in the fields of accounting and auditing.

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INSOLVENCY PREDICTION IN COMPANIES: AN EMPIRICAL STUDY IN ITALY

Elisa Giacosa, Alberto Mazzoleni**, Claudio Teodori**, Monica Veneziani***

Abstract

The study stems from the relevance of the global economic crisis which is affecting companies to an increasing extent. The objective of the paper is to test the degree of effectiveness of the insolvency prediction models, most widely used in the literature, including recent works (Jackson and Wood, 2013), with reference to Lombardy, the most important Italian region in terms of industrialization rate. The following models were used, selected according to their diffusion and the statistical technique used: 1) Discriminant analysis (Altman, 1983), (Taffler, 1983); 2) Logit Analysis (Ohlson, 1980). The study identifies the state of health of companies in 2012, using the financial reporting data of the three previous years. The research sample consists of 58,750 companies (58,367 non-failed and 383 failed). Among the main results, it is observed that, for all the models, a prediction of default is often erroneously made for companies which are solvent, whereas failed companies are classified with a lower degree of error. The objective of the paper is preparatory to the second part of the research in progress in which, on the basis of the results presented here, some modifications will be made to the insolvency prediction models selected, significant for the Italian context, with the aim of identifying a company insolvency "alert model" which can be used by the various stakeholders. The results are interpreted in the light of the Stakeholder Theory***.

Keywords: Prediction Models, Economic Crisis, Financial Reporting Data, Italian Companies, Stakeholder Theory

**University of Turin*
***University of Brescia*
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1 Introduction

The study stems from the relevance of the global economic crisis which is affecting companies to an increasing extent. In particular, the frequency with which insolvency situations occur provides a stimulus for the development and analysis of themes concerning the prediction and prompt identification of situations considered to be at risk, in order to implement all the activities necessary to prevent them or to set up turnaround processes.

The success of a company turnaround obviously also depends, to a significant degree, on early identification of the insolvency symptoms with the creation, where possible, of reference categories; when these occur, the companies and the stakeholders most involved can take constructive steps to promptly identify lines of action. Once an insolvency situation has been identified, the companies must be able to deal with it effectively and with the correct timing, intervening on the causal factors which are often connected with management decisions that are not correct or are not coherent with the complexity of the competitive context.

In the light of this framework, the objective of the paper, which forms part of a wider research project, is to test the degree of effectiveness of the insolvency prediction models, selected on the basis of the main statistical techniques used and their citation index, employed also in recent literature (Jackson and Wood, 2013), with reference to Lombardy, the most important Italian region in terms of industrialization rate. The reference period is the global economic crisis from 2009 to 2012. The overall research sample consists of 58,750 companies comprising non-failed and failed companies.

In particular, the following models were used:

1) Discriminant analysis
1a) Altman (1983);
1b) Taffler (1983);
2) Logit Analysis
Ohlson (1980).

The objective of the paper is preparatory to the second part of the research in progress in which, on the basis of the results presented here, some modifications will be made to the insolvency prediction models selected, significant for the Italian context, with the aim of identifying a company insolvency "alert model" which can be used by all the stakeholders.

The results of this paper (and of the second part of the research in progress) are interpreted according to the Stakeholder Theory (Freeman, 1984; Donaldson and Preston, 1995) which recognises that organisations have many stakeholders to whom they relate and to whom they are accountable: primary stakeholders (shareholders, debt-holders, banks, customers, suppliers, employees) and secondary stakeholders (governments, society, community, charities). Each of these parties, in various ways,

directly or indirectly undergoes the effects of the global economic crisis: therefore, the study of company insolvency and the possibility of forecasting it in advance to avoid worse consequences are of interest to civil society in general, i.e. the context in which the company operates. It happens firstly via the application of insolvency prediction models and, secondly, via the adaptation of these models to specific economic contexts, in our case Italy.

The paper continues in the following order: paragraph two recalls the Italian background in terms of legal instruments functional to overcoming the insolvency and used in the paper for the classification of companies into non-failed and failed; paragraph three offers a summary of the literature on the insolvency prediction models considered in the paper; paragraph four describes the sample of companies and the research method; paragraph five explains the results; the last paragraph presents the conclusions, implications, limitations and future evolution of the research.

2 The legal instruments for overcoming company insolvency in Italy

The occurrence of an insolvency situation entails a frequent process of erosion of the capacity to produce positive economic results, liquidity and self-financing by the company, in addition to a sudden loss of confidence of the main stakeholders. The company turnaround can be oriented to winding-up or to continuation in relation to its ability to resume operation with good economic and financial performance.

In terms of the legal instruments to support the turnaround, two scenarios can be identified (with different roles and impact on the turnaround) depending on whether the process is carried out through the courts or not.

The first case comprises turnaround processes based on debt restructuring agreements, composition with creditors, bankruptcy and the other procedures specifically established by the law which presuppose recourse to the courts, in various ways.

The second case (out of court restructuring) comprises turnaround processes for which no legal instrument is used or those in which the *certified recovery plans* established by art. 67 third paragraph letter d) of the Italian Bankruptcy Act, the so-called workouts, are used.

In the paper, explicit reference is made to the first type for the distinction between non-failed and failed companies in preparation of the sample. Debt restructuring agreements and composition with creditors are the instruments selected as they represent the most widespread ones, used and geared to enabling a company to make an effective turnaround, at least in theory. These two instruments are presented briefly below (Giacosa and Mazzoleni, 2012).

2.1 Debt restructuring agreements

The current law provides that «The entrepreneur in a state of insolvency can request, submitting the documentation specified in art. 161 of the Italian Bankruptcy Act, the approval of a debt restructuring agreement stipulated with the creditors representing at least sixty percent of the credits, together with a report drawn up by a professional, in possession of the legal requirements, on the truthfulness of the company data and the practicability of the agreement, with particular reference to its suitability to ensuring regular payment of the outside creditors in compliance with the following terms:

– within one hundred and twenty days from the approval, in the case of credits already past their due date at the date of approval;

– within one hundred and twenty days from the due date, in the case of credits not yet past their due date at the date of the approval».

The insolvent company can therefore reach agreements with its creditors (representing at least 60% of the overall indebtedness) aimed at rescheduling the debts, writing them off or identifying intermediate solutions. These agreements must be implemented to allow the company to resume operation with good economic and financial performance. The parties outside the agreement must be paid within the terms established by the law. The agreements with the creditors must be negotiated individually and each creditor may be treated differently.

2.2 Composition with creditors

Art. 160 of the Italian Bankruptcy Act establishes that «An entrepreneur in a state of insolvency can propose a composition with the creditors on the basis of a plan which can entail:

– restructuring of the debts and payment of the credits in various ways (…);

– attribution of the assets of the companies interested in the composition proposal to a third party (....);

– grouping of the creditors into classes according to similar legal positions and economic interests;

– different treatment of creditors belonging to different classes».

Under composition with creditors, the company can be wound up or can continue operating.

Via composition with creditors, the company's assets are "protected" in the sense that the creditors cannot take legal action to recover their credits either during preparation of the composition plan or during execution of the procedure.

The insolvent company proposes to its creditors a method for resolving its obligations via the composition plan (payment extensions, attribution to the creditors of company assets, write-off of the

original credits, etc.). The proposal is voted by the creditors (only the non-secured creditors) and passed by a majority vote (51% of the nominal value of the credits).

The composition plan must also be certified by a professional expert in possession of the legal requirements.

3 Literature review

The models selected are those used most widely in the literature, also recently (Jackson and Wood, 2013); due to their widespread use, it is important to verify their effectiveness in the current economic context, also in the light of the fact that the authors have used their original model in more recent studies. For example, Agarwal and Taffler (2007) re-apply the model of Taffler (1983) to a sample of British companies; likewise, Altman, Danovi and Falini (2013) apply the Altman model (1983) to a sample of Italian companies.

All the models, regardless of the statistical technique used, can generate two types of errors; to each of these, a cost must be associated which varies according to the objectives pursued:

– First Type Error, when a failed company is classified as non-failed;

– Second Type Error, when a non-failed company is classified as failed.

3.1 Discriminant analysis

Discriminant analysis is a statistical technique which allows a company to be distinguished in the context of two or more pre-defined groups (Fisher, 1936; Teodori, 1989; Jackson and Wood, 2013), i.e. the group of non-failed companies and the group of failed companies. These groups, in the study, are defined *a priori* on the basis of the characteristics illustrated in par. 4.1. During the application of discriminant analysis, the linear form was chosen as it is the one most widely used in the literature up to 1980 and, also after this date, it represents a base model for the application of subsequent models (Balcaen and Ooghe, 2004; Altman and Narayanan, 1997; Aziz and Dar, 2006)[4].

[4] It is expressed as follows:

$$z_i = a + \beta_1 X_{i1} + \beta_2 X_{i2} + ... + \beta_m X_{im}$$

where:
α = constant
i = identifies the i-th company (from 1 to n)
j = identifies the variables or the indexes which constitute the model (from 1 to m)
m = overall number of variables considered (in the ambit of the indexes considered)
z_i = Z-score attributed to the i-th company
X_{ij} = value assumed by the index j for the company i
B_j = discriminant coefficient for the j-th variable (weight attributed to the index j)

The Z-score attributed to each company represents, in one single value, the information deriving from the m common variables referring to that company. Via this value, the company is classified as belonging to one of the two universes (group of non-failed companies or group of failed companies). The higher the Z-score of a company, the lower the possibility of the company being classified as a failed company.

For the purposes of this classification, a Z-score (cut-off point) is defined, which allows the two groups of companies (group of non-failed companies or group of failed companies) to be distinguished as clearly as possible. For application purposes, the cut-off points considered are those identified in the individual discriminant analysis models chosen in the study.

If the Z-score of a company is below the cut-off point, the company is classified as failed; if the Z-score of a company is higher than the cut-off point, it is classified as non-failed.

The choice of discriminant analysis in this study is due to the fact that this statistical technique underlies a series of authoritative studies in the literature on the subject, such as Altman (1968), Deakin (1972), Edmister (1972), Blum (1974), Libby (1975), Alberici (1975), Taffler (1976-1977), Altman, Haldeman and NaraYnan (1977), Deakin (1977), Lincoln (1984), Altman (1983), Mantoan and Mantovan (1987), (1987), Aziz et al (1988), Altman et al (1994), Back at al (1996), Booth (1983), Casey and Bartczak (1984), Coats and Fant (1993), Dimitras et al. (1999), El Hennawy and Morris (1983), Frydman et al. (1985), Gombola et al. (1987), Jo et al. (1997), Kahya and Theodossiou (1999), McGurr and DeVaney (1998), Moyer (1977), Piesse and Wood (1992), Pompe and Feelders (1997), Sung et al. (1999), Taffler and Tisshaw (1977), Theodossiou (1993), Yang et al. (1999). Other studies have also applied this methodology, thanks to the frequency of application in literature (Beyonon and Peel, 2001; Neophytou et al, 2001; Brockamn and Turtle, 2003; Agarwal and Taffler, 2007 and 2008; Jackson and Wood, 2013).

In the context of discriminant analysis, this study analyses the models of Altman (1983) and Taffler (1983), due both to their popularity in the literature (Balcaen and Ooghe, 2004 and 2006; Reisz and Purlich, 2007; Jackson and Wood, 2013) and the possibility of applying them to a sample of non-listed companies.

3.1.1 Altman (1983)

The model is as follows:

$$Z_i = a + \beta_1 \frac{WC}{TA} + \beta_2 \frac{RE}{TA} + \beta_3 \frac{EBIT}{TA} + \beta_4 \frac{BV_E}{TL} + \beta_5 \frac{S}{TA}$$

where:
α = constant
WC/TA = working capital/total assets
RE/TA = retained earnings/total assets
EBIT/TA = earning before interest and taxes/total assets
BV_E/TL = book value equity/total liabilities
S/TA = sales/total assets

For application purposes, the variables α, β_1, β_2, β_3, β_4 refer to Altman model (1983), as this study is geared to non-listed companies. The model applied is therefore as follows:

$$Z = 0.717 \frac{WC}{TA} + 0.847 \frac{RE}{TA} + 3.107 \frac{EBIT}{TA} + 0.420 \frac{BV_E}{TL} + 0.998 \frac{S}{TA}$$

3.1.2 Taffler (1983)

The proposed model is as follows:

$$z = a + \beta_1 \frac{PBT}{CL} + \beta_2 \frac{CA}{TL} + \beta_3 \frac{CL}{TA} + \beta_4 NCI$$

where:
α = constant
PBT/CL = profit before tax/current liabilities
CA/TL = current assets/total liabilities
CL/TA = current liabilities/total assets
NCI = (current asset-stock-current liabilities)/daily operating costs (excluding depreciation)

For application purposes, the variables α, β_1, β_2, β_3, β_4 refer to Taffler model (1983). The model applied is therefore as follows:

$$z = 3.2 + 12.18 \frac{PBT}{CL} + 2.5 \frac{CA}{TL} - 10.68 \frac{CL}{TA} + 0.029 NCI$$

3.2 Logit analysis

The models based on this analysis show the probability of a company belonging to the group of non-failed companies or the group of failed companies, defined *a priori* according to a series of characteristics[5].

Here again, the choice of the Logit model is due to the fact that this statistical technique underlies a series of authoritative studies in the literature, such as Ohlson (1980), Zavgren (1985), Forestieri (1986), Aziz et al (1988), Keasey and McGuiness (1990), Dimitras et al (1999), Aziz et al (1988), Keasey and McGuiness (1990), Dimitras et al (1999), Back et al. (1996), Kahya and Theodossiou (1999), Laitinen and Laitinen (1998), McGurr and DeVaney (1998), Platt and Platt (1990), Salchenberger et al. (1992), Theodossiou (1991), Ward (1994). More recent studies have also applied this methodology (Jackson and Wood 2013; Back et al,1996; Beyonon and Peel, 2001; Neophytou et al, 2001; Foreman, 2002; Brockamn and Turtle, 2003; Lin and Piesse, 2001; Westgaard and Wijst, 2001). In the ambit of the Logit

[5] The formula of the model used in the study is the following:

$$P_i = E\left(Y = 1 \mid X_i = \frac{1}{1 + e^{-(a + \beta_1 X_{i1} + \beta_2 X_{i2} + \ldots + \beta_m X_{im})}} = \frac{1}{1 + e^{-Z}}\right)$$

where:
α = constant
i = identifies the i-th company (from 1 to n)
j = identifies the variables or the indexes that constitute the model (from 1 to m)
Y = variable which assumes value 1 (if the company is insolvent) or 0 (if the company is solvent)
P_i = the probability that the company i has failed observing the values assumed by the m indexes which define the model (given the values of the indexes, considered by the model for the company i, P_i identifies the probability that the company analysed has failed)
X_{ij} = value assumed by the index j for the company i
β_j = weight (or coefficient) attributed to the index X_j

model, we have chosen to adopt the Ohlson model (1980), in view of its popularity in the reference literature (Balcaen and Ooghe, 2004 and 2006; Jackson and Wood, 2013).

3.2.1 Ohlson (1980)

This model determines the probability of default of a company on the basis of a set of variables. It establishes three different operating modes:

– prediction of default within one year from application of the model;

– prediction of default within two years, if the company is not in default in the first year;

– prediction of default in one of the two years considered.

In the study, the first operating mode was chosen. This choice is justified by the fact that it is the one considered by the author of the model himself (Ohlson, 1980) as the most effective in predictive terms. The model is as follows:

$$z = a + \beta_1 SIZE + \beta_2 \frac{TL}{TA} + \beta_3 \frac{WC}{TA} + \beta_4 \frac{CL}{CA} + \beta_5 OENEG + \beta_6 \frac{NI}{TA} + \beta_7 FUTL + \beta_8 INTWO + \beta_9 CHIN$$

where:

α = constant

SIZE = natural logarithm of GDP-deflated total assets

TL/TA = total liabilities/total assets

WC/TA = working capital/total assets

CL/CA = current liabilities/current assets

OENEG = dummy variable equal to one if total liabilities exceed total assets, and zero otherwise

NI/TA = net income/total assets

FUTL = fund from operations (pretax income + depreciation + amortization)/total liabilities

INTWO = dummy variable equal to one if net income was negative over previous two years, and zero otherwise

CHIN = scaled change in net income calculated as $(NI_t – NI_{t-1})/(|NI_t| + |NI_{t-1}|)$ where NI_t is the net income for the most recent period

For application purposes, the variables α, β_1, β_2, β_3, β_4 refer to Ohlson model (1980). The model applied is therefore as follows:

$$z = -1.32 - 0.407 SIZE + 6.03 \frac{TL}{TA} - 1.43 \frac{WC}{TA} + 0.0757 \frac{CL}{CA} - 1.72 OENEG - 2.37 \frac{NI}{TA} - 1.83 FUTL + 0.285 INTWO - 0.521 CHIN$$

4 The sample and the research method

4.1 The sample

For development of the analysis, we referred to the economic fabric of Lombardy, a region in northern Italy. The area was considered suitable for the purposes of the study as it has the highest industrialization rate in Italy (Confindustria Study Centre, 2011): within the area, five courts were selected on the basis of their willingness to collaborate in the research[6]. Lombardy produces 21.3% of GNP, while the geographical areas under the jurisdiction of the courts involved contribute in the amount of 15.1% of GNP (processing of Eurostat data 2012). In 2012, the companies in Lombardy account for 19.1% of the overall turnover of the companies operating in Italy: those analysed represent 73.9% of the turnover of the entire region.

The companies[7] are classified according to business sector, adopting the Ateco classification of the National Institute of Statistics (Istat).

The study identifies the state of health of the companies in 2012: the forecast is made using the financial statement values of the three previous years (2009, 2010 and 2011). For this reason, the companies were identified with reference to the beginning of 2009, in order to ensure the availability of three years of financial reporting data (Table 1 in appendix).

[6] The courts are: Milan, Brescia, Bergamo, Mantua and Cremona. The first refers to the regional capital; the other four refer to the provinces of Eastern Lombardy bordering with Veneto, another important region for the Italian economy.

[7] The companies were identified using the Aida-Bureau van Dijk database, which contains economic-financial information on over one million Italian companies.

Table 1. Companies for industry (Ateco 2007)

Industry (first level)	Industry (second level)	Total companies
Agriculture, forestry and fishing	Crop and animal production, hunting and related service activities Forestry and logging Fishing and aquaculture	719
Accommodation, food and beverage	Accommodation Food and beverage service activities	2,803
Cultural activities	Creative, arts and entertainment activities Sports activities and amusement and recreation activities	1,172
Financial activities	Financial service activities, except insurance and pension funding Activities auxiliary to financial services and insurance activities	1,945
Professional activities	Legal and accounting activities Activities of head offices; management consultancy activities Architectural and engineering activities; technical testing and analysis Scientific research and development Advertising and market research Other professional, scientific and technical activities	9,510
Trade	Wholesale and retail trade and repair of motor vehicles and motorcycles Wholesale trade, except of motor vehicles and motorcycles Retail trade, except motor vehicles and motorcycles	15,003
Construction activities	Construction of buildings Civil engineering Specialised construction activities	11,728
ICT	Publishing activities Programming and broadcasting activities Computer programming, consultancy and related activities Information service activities	4,465
Real estate activities	Real estate activities	20,958
Manufacture	Manufacture of food products Manufacture of beverages Manufacture of textiles Manufacture of wearing apparel Manufacture of leather and related products Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials Manufacture of paper and paper products Printing and reproduction of recorded media Manufacture of coke and refined petroleum products Manufacture of chemicals and chemical products Manufacture of basic pharmaceutical products and pharmaceutical preparations Manufacture of rubber and plastic products Manufacture of other non-metallic mineral products Manufacture of basic metals Manufacture of fabricated metal products, except machinery and equipment Manufacture of computer, electronic and optical products Manufacture of electrical equipment Manufacture of machinery and equipment Manufacture of motor vehicles, trailers and semi-trailers Manufacture of other transport equipment Manufacture of furniture Other manufacturing Repair and installation of machinery and equipment	15,638
Business support activities	Rental and leasing activities Employment activities Travel agency, tour operator reservation service and related activities Office administrative, office support and other business support activities	2,602
Transport and warehousing	Land transport and transport via pipelines Warehousing and support activities for transportation	2,169
Utilities	Waste collection, treatment and disposal activities; materials recovery	301
	Total	**89,013**

Within the population (Table 1), two groups of companies, non-failed and failed, were identified with the criteria described below.

a) The non-failed companies are those in the following conditions:

– they were not subject, in the period examined, to any insolvency proceedings and did not present any application for admission to insolvency proceedings in 2012;

– they were operating (not failed) up to the end of 2012.

b) The failed companies are those which, in 2012, are in the following conditions:

– they have submitted to the court an application for admission to the insolvency proceedings considered in the study (debt restructuring agreements pursuant to art. 182-bis of the Italian Bankruptcy Act, and composition with creditors pursuant to art. 160 and following of the Italian Bankruptcy Act) or have been admitted to the above-mentioned insolvency proceedings by the end of 2012. The decision to consider even just an application for admission is due to the fact that the admission procedure requires a period of investigation and assessment by the court, which can last several months. We therefore wished to recognise the document in which, after an assessment of its state of health, the company formalizes the need to resort to insolvency proceedings. Companies undergoing other insolvency proceedings (administrative compulsory liquidation, extraordinary administration proceedings) which are not common or are intended for specific types of companies and are therefore of limited general interest, were excluded;

– have been declared bankrupt[8].

The companies that submitted to the court an application for admission to insolvency proceedings, considered in the study as failed, were identified using the information provided by the registrar's office of the courts[9] for the geographical reference area.

After defining the conditions for a company to be classified as non-failed or failed, the next step is verification that they possess all the information necessary for full application of the models.

The following were excluded from the non-failed companies initially identified:

– those in which the absence of detail in certain financial reporting data, the amount of which accounts for over 2.5%[10] of the total reference value, does not allow to calculate the variables of the company insolvency prediction models (17,608 companies);

– those whose financial statement contains a non-reconcilable balancing error, again accounting for over 2.5% of the total (660 companies);

– those in which the absence of some financial reporting data in the reference time horizon does not allow the calculation of one or more variables of the company insolvency prediction models (5,400 companies);

– those who submitted a request for voluntary winding up or cancellation from the business register, for reasons other than company insolvency (6,632);

– those who submitted an application for admission to insolvency proceedings prior to 2012[11] (50 companies);

– those who were admitted to other insolvency proceedings different from those examined (168 companies);

– those who have submitted an application for admission to the insolvency proceedings examined but who have not yet been admitted by the court (128 companies).

Overall, 58,367 non-failed companies were selected (Table 2).

Initially, 1,834 failed companies were identified (Table 2).

Here again, some exclusions had to be made, due to the difficulty of obtaining complete information. The following companies were excluded:

– those who do not have financial statements for the entire reference time horizon of the study (1.062 companies);

– those in which the absence of detail in certain financial reporting data, the amount of which accounts for over 2.5% of the total reference valur, does not allow to calculate the variables of the company insolvency prediction models (194 companies);

– the absence of some financial reporting data in the reference time horizon does not allow the calculation of one or more variables of the company insolvency prediction models (195 companies).

Overall, 383 failed companies were selected (Table 2).

The overall sample of the study therefore consists of 58,750 companies: 58,367 non-failed and 383 failed, 155 of which are bankrupt.

[8] 12,442 companies were declared bankrupt in 2012 in Italy (2.1% of the total number of operating companies), 1,899 (2.1%) of which in the courts examined and 2,817 (2.2%) in Lombardy as a whole.

[9] The registrar's office at the court is the office that receives the applications for admission to insolvency proceedings, and identifies the companies admitted to the insolvency proceedings and the bankrupt companies.

[10] There is no shared threshold for measuring the materiality connected with the financial statement values; many references are present only in operating practice. The figure of 2.5% was established considering the need for a full and expressive applicability of the models and is equivalent to the mean of the values generally taken as the reference in Italian practice.

[11] These companies cannot be considered non-failed given their insolvency in progress, neither are they considered among the failed companies, since the year of presentation of the application for insolvency proceedings does not comply with the time requirement of the study.

Table 2. Initial and selected companies per industry

Industry	Initial failed companies	Selected failed companies	Selected non-failed companies
Agriculture, forestry and fishing	5	2	489
Accommodation, food and beverage	70	6	1,083
Cultural activities	23	3	706
Financial activities	16	4	849
Professional activities	111	18	4,924
Trade	349	75	10,429
Construction activities	399	65	7,567
ICT	55	9	2,830
Real estate activities	144	23	14,032
Manufacture	486	150	11,546
Business support activities	42	6	1,546
Transport and warehousing	66	13	1,438
Utilities	4	1	208
Others	64	8	0
Total	**1,834**	**383**	**58,367**

4.2 The research method

The three models were applied to the financial statements of the companies in the sample in the period 2009-2011: the results of the models were then compared with the state of health of the companies in 2012, in order to measure the degree of effectiveness achieved[12].

The three company insolvency prediction models were applied in order to verify their effectiveness over a period of three years (2009-2011), two years (2010-2011) and one year (2011) prior to occurrence of the default situation. The models are applied in three modes:

a) use of all the companies available, without distinction. The validity of this mode is supported by the literature (Jackson and Wood, 2013). In particular, the numerousness of the reference sample has been considered positive also in other studies: of these, Ohlson (1980) applied the original model to groups containing a different number of companies, underlining the importance of the groups with the highest number of companies. This was also maintained in the study by Falkestein, Boral and Carty (2000), according to which the hazard model of Shumway (1999) shows a high effectiveness compared to other models due to the numerous sample examined;

b) use of reduced groups chosen at random, without recourse to further distinctions (sector and/or dimension). A sample of 60 failed companies was set against a sample of 60 non-failed companies, i.e. an overall number of 120 units for each sample. 2,000 samples were constructed on which the models were applied;

c) use of reduced groups chosen at random, this time using specific classification criteria, such as business sector and size. This method was used in the original work by Altman (1968). In this regard, some scholars, such as Beaver (1966), Libby (1975), Taffler (1983), Keasey and McGuinness (1990), Caritou et al. (2004) have maintained that the sample of non-failed companies and the sample of failed companies must contain the same number of companies and company composition in terms of sector and size. In particular, this number differs from model to model (for example, Altman (1968) uses samples of 33 companies; Altman, Haldeman, and Narayanan (1977) use a sample of 53 failed companies and 58 non-failed companies correlated in terms of size and sector); Taffler (1983) uses groups of 46 non-failed and failed companies. In this study, we used a sample of 53 failed companies (chosen at random), belonging to different sectors and having a given turnover, and another sample of 53 non-failed companies (chosen at random), having the same characteristics in terms of sector and size. For each sector, a maximum of two companies were identified (minimum one company) belonging to at least one turnover class[13], for a maximum total of 6 non-failed companies and 6 failed companies (minimum 1 non-failed and 1 failed). The sample of 53 companies therefore consists of companies belonging to the following sectors: Agriculture, forestry and fishing; Manufacture; Construction activities; Trade; Utilities; Transport and warehousing; Accommodation, food and beverage; ICT; Financial activities; Real estate activities; Professional activities; Business support activities and Cultural activities. The numerousness of the sample (i.e. 53 companies) is due to the fact that, considering the different observation criteria (sector

[12] For the purposes of application of the insolvency prediction models, the financial reporting data were obtained from the Aida-Bureau van Dijk database, while the GDP price-level index was obtained from the World Bank.

[13] Three sizes were identified for the companies analysed: micro-company (for turnover from 0 a 2 ml euro), small company (for turnover from 2 to 10 ml euro) and medium-sized company (10 to 50 ml euro).

and size), the threshold of 53 companies represents the maximum number possible for each sample.

In addition, the models were applied according to the above three modes to the sectors considered most significant in terms of failed companies. In particular, mode a) was applied to Manufacture, Construction activities, Trade, Real estate activities, Transport and warehousing, and Professional activities. Modes b) and c) were applied to the Manufacture sector, the only one characterised by a population of failed companies with the characteristics necessary for application of modes b) and c).

In order to ensure comparability of the results obtained from the above modes, the effectiveness of the individual models is tested using the ROC Curve constructed following Gönen (2006). Having chosen a cut-off point with which to compare the results obtained from the models, the companies are distinguished according to whether they belong to the group of non-failed companies or the group of failed companies.

To establish the effectiveness of the models, a contingency table was used (Table 3), which allows identification of the first and second type errors:

Table 3. Error types

Result prediction	Values observed	
	Non-failed	Failed
Non-failed	TP	FP
Failed	FN	TN

where:
TP (True Positive): a non-failed company is correctly classified;
FP (False Positive): represents a first type error;
FN (False Negative): represents a second type error;
TN (True Negative): a failed company is correctly classified.

The contingency table is also useful for calculating the sensitivity and 1-specificity parameters (the combination of which represents a point on the ROC Curve):

– sensitivity = TP/(TP+FN): represents the percentage of non-failed companies correctly identified by the model;

– specificity = (TN/(FP+TN): represents the percentage of failed companies correctly identified by the model.

To construct the curve, it was necessary to vary the cut-off point, create a new contingency table and then use various combinations of sensitivity and 1-specificity. Therefore, each cut-off point corresponds to a new contingency table, i.e. a new classification of the companies into non-failed and failed from which the new sensitivity and specificity values are deduced.

As the value of the cut-off point increases, the number of companies classified as non-failed decreases and the number of companies classified as failed increases and vice versa. The ROC Curve therefore graphically represents the sensitivity values (on the Y axis) and 1-specificity values (on the X axis), obtained by varying the cut-off point.

For the purposes of our analysis, the cut-off points used for construction of the ROC Curve correspond to the percentiles of the values in terms of Z-Score and probability obtained by applying the models. For the 101 cut-offs identified, the sensitivity and specificity values are deduced: the sensitivity and 1-specificity simultaneously assume the value 1 if the cut-off used is the absolute minimum value assumed by the z-Scores or by the probability (Logit model).

The effectiveness of the model is represented by the area below the ROC Curve, defined Theta, which is estimated using the Trapezoid Rule (Hanley and McNeil, 1982; Shi-Tao Yeh and GlaxoSmithKline, 2002). The Standard Error of Theta (Hanley and McNeil, 1982) represents an estimate of the variability of the model, i.e. a measurement of its inaccuracy: the lower the Standard Error, the more the sample is representative of the population[14].

The significance in statistical terms of the Theta estimated for each model is tested by means of the Z test (Jackson and Wood, 2013; Barniv, Agarwal and Leach, 2002)[15].

Another tool for evaluating the effectiveness of the models is the Accuracy Ratio (AR), calculated in

[14] The formula used in quantification of the Standard Error is the following:

$$SE(\hat{\theta}) = \sqrt{\frac{\hat{\theta}(1-\hat{\theta}) + (n_F - 1)(Q_1 - \hat{\theta}^2) + (n_N - 1)(Q_2 - \hat{\theta}^2)}{n_F n_N}}$$

where:

$$Q_1 = \frac{\hat{\theta}}{2-\hat{\theta}} = Theta$$

n_F = numerousness of failed companies
n_N = numerousness of non-failed companies
Q_1 = estimate of probability that two companies drawn at random from the group of failed companies both have higher values in terms of bankruptcy probability than a company drawn at random from the group of non-failed companies.

[15] The test is the following:

$$z = \frac{\theta - 0.5}{SE(\hat{\theta})}$$

where:
$\hat{\theta}$ = the area below the ROC Curve
$SE(\hat{\theta})$ = standard error of the estimate

relation to the study by Engelmann, Hayden and Tasche (2003) as $AR = 2(\hat{\theta} - 0.5)$. The perfect model reports an AR equal to 1.

In order to assess the effectiveness of each model, the distribution properties of the estimate of Theta were identified by applying mode b), previously illustrated, 2,000 times on random samples.

Following these applications, the values calculated with reference to Theta are the mean, the median, the standard error, the skewness and the excess kurtosis (more precisely the excess of kurtosis with respect to the value assumed by a normal distribution). On the basis of these last parameters, the Jarque and Bera test (1987) was used to assess whether the Thetas obtained have a normal distribution.

The threshold values corresponding to the significance levels of 1% and 5% are 9.21 and 5.99 respectively. The distribution is normal for limited values of the Jarque and Bera test: if the test assumes values greater than 9.21, the error committed by affirming that the distribution is not normal is less than 1%; if the values of the Jarque and Bera test are below 9.21, it means that the value of the test is part of the 99% of the observations characterising a Chi square with 2 degrees of freedom. If, corresponding to the values assumed by the skewness and the excess kurtosis, the value assumed by the test is below 5.99, the distribution analysed is not normal and an error greater than 5% is committed.

Having assessed the accuracy, the percentages of correct classification of the non-failed companies and the failed companies are drawn up applying the models, taking as cut-off point those used by the original authors (Table 4).

Table 4. Cut-off points

Models	Non-failed companies	Failed companies	Grey area
Altman (1983)	Z- Score > 2.9	Z- Score < 2.23	2.23 < Z-Score < 2.9
Taffler (2007)	Z- Score > 0	Z- Score < 0	
Ohlson (1980)	Probability < 0.5	Probability > 0.5	

5 Findings

Below, the results are distinguished according to the application mode.

5.1 Application mode a)

The models were applied to the entire sample, i.e. to all the companies available. The results are indicated in the following table (Table 5).

Table 5. Results of application mode a)

Models	Theta	SETheta	Z	AR
Altman prediction 3 years	67.73%	0.015	11.658	0.35
Taffler prediction 3 years	67.61%	0.015	11.572	0.35
Ohlson prediction 3 years	57.31%	0.015	4.779	0.15
Altman prediction 2 years	70.19%	0.015	13.428	0.40
Taffler prediction 2 years	69.40%	0.015	12.849	0.39
Ohlson prediction 2 years	61.62%	0.015	7.556	0.23
Altman prediction 1 year	79.11%	0.014	21.059	0.58
Taffler prediction 1 year	75.55%	0.014	17.704	0.51
Ohlson prediction 1 year	76.25%	0.014	18.327	0.53

The Theta analysis shows that all the models are more effective in prediction roughly one year prior to manifestation of the insolvency. The discriminant analysis models, i.e. Altman (1983) and Taffler (1983), are more effective in prediction of company insolvency 3 and 2 years prior to occurrence of the event than the Logit model of Ohlson (1980). In the prediction of insolvency 1 year before the event, the effectiveness of the Logit model of Ohlson (1980) significantly increases with respect to the prediction of insolvency 3 and 2 years prior to the event: this confirms what the author himself says concerning the effectiveness of his model in prediction one year before the event.

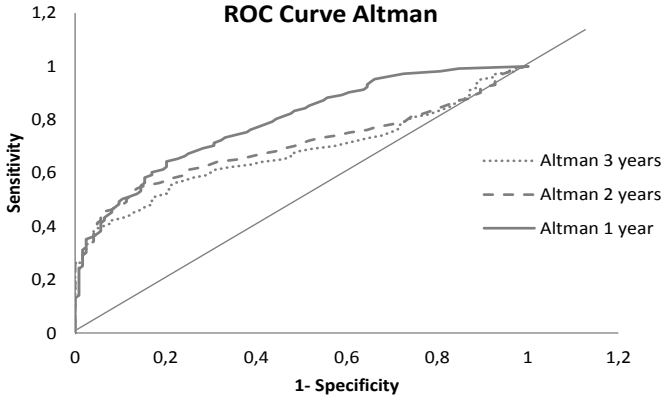
Observing the Standard error of Theta, no differences emerge in relation to the effectiveness of the three models in the 3 and 2 year prediction. On the contrary, this parameter decreases in the prediction 1 year prior to the event, uniting all the models: it follows that the shorter the time period preceding manifestation of the company insolvency, the more accurate the prediction.

Observing the values of the Z test, it emerges that the models have a better prediction capacity than the random model (which has a mean effectiveness of 50%). The results obtained confirm that the prediction error decreases the closer it gets to manifestation of the company insolvency. Also analysing the

information produced by the parameter AR, it emerges that the model of Altman (1983) has a better prediction capacity, with the exception of the 3-year prediction where the discriminant analysis models (Altman (1983) and Taffler (1983) are comparable.

The ROC Curves for the different models considered are given below. The following figure presents the ROC Curve for application of the Altman model (1983) (Figure 1).

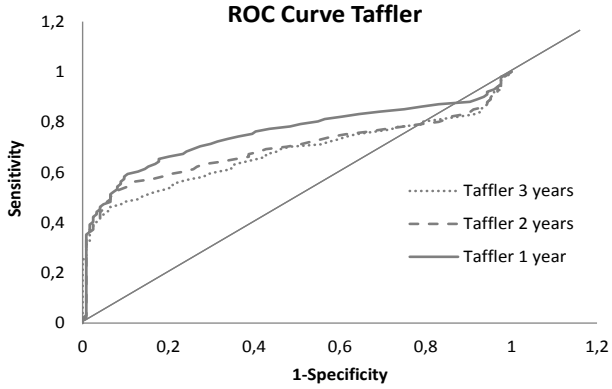
Figure 1. The ROC Curve of Altman (1983)



It can be seen that the highest Roc Curve (i.e. farthest from the straight line at 45°, which represents the line corresponding to the random model) is the one deriving from application of the model 1 year prior to manifestation of the event, demonstrating the greater accuracy of the model. The lowest one, on the other hand, is the one deriving from application of the model 3 years prior to manifestation of the event, demonstrating its lesser accuracy. In addition, it can be noted that the tendency of the ROC Curve at 3 years and 2 years, in its final part (i.e. approaching the 1-Specificity value of 1), shows a behaviour similar to the straight line at 45°, which is typical of the random prediction. In the 1-year prediction, on the other hand, the ROC Curve is evidently detached from the line at 45°, i.e. the prediction made by the model is not random.

The following figure presents the ROC Curve of application of the Taffler model (1983) (Figure 2).

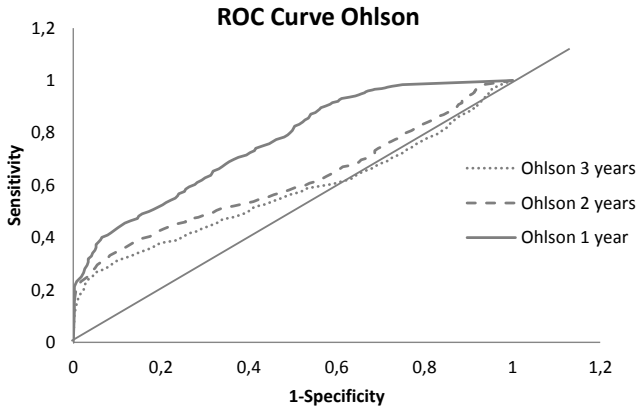
Figure 2. The ROC Curve of Taffler (1983)



As with the Altman model (1983), the greater effectiveness of the model in prediction 1 year prior to the event is confirmed, whereas the lowest effectiveness derives from application of the model 3 years prior to the event. An anomalous trend of the ROC Curve in the years considered can be seen: it is concave (i.e. normal) in the 3-year prediction, and convex (i.e. anomalous) in the 2 and 1 year prediction.

The following figure presents the ROC Curve of application of the Ohlson model (1980) (Figure 3).

Figure 3. The ROC Curve of Ohlson (1980)



As observed for the two previous models, the Ohlson model (1980) is more effective in the prediction 1 year prior to the event.

The percentages of companies correctly classified as non-failed or failed are given below, with reference both to the entire sample of non-failed companies and to the entire sample of failed companies.

The results deriving from the Altman model (1983) are given in Table 6.

Table 6. Results of the Altman model (1983)

Models	Sample of non-failed companies			Sample of failed companies		
	% non-failed correctly predicted	% non-failed grey area	Second Type Error	% failed correctly predicted	% failed grey area	First Type Error
Altman 3-year prediction	19.78%	40.06%	40.16%	64.49%	33.16%	2.35%
Altman 2-year prediction	20.11%	40.41%	39.48%	72.85%	24.54%	2.61%
Altman 1-year prediction	20.42%	40.02%	39.56%	84.07%	13.84%	2.09%

It emerges that both the first type error (i.e. a failed company classified as a non-failed company) and the second type error (i.e. a non-failed company classified as a failed company) decrease around 1 year prior to manifestation of the company insolvency. In particular, it emerges that the second type error decreases more than the first type error as the event approaches.

The results deriving from the Taffler model (1983) are given in Table 7.

Table 7. Results of the Taffler model (1983)

Models	Sample of non-failed companies		Sample of failed companies		Overall sample
	% non-failed correctly predicted	Second Type Error	% failed correctly predicted	First Type Error	% correct predictions
Taffler 3-year prediction	47.86%	52.14%	88.77%	11.23%	48.12%
Taffler 2-year prediction	49.33%	50.67%	90.08%	9.92%	49.60%
Taffler 1-year prediction	49.35%	50.65%	93.99%	6.01%	49.65%

Given that the Taffler model (1983), unlike the Altman model (1983), does not comprise a grey area (i.e. an area of uncertainty in the classification), the following emerges in the prediction 3, 2 and 1 years prior to the event: in the sample of non-failed companies, the second type error assumes higher values than the Altman model (1983) considering, however, that the latter comprises a grey area into which many of the non-failed companies fall; for the sample of failed companies, the first type error assumes higher values than the Altman model (1983). To summarise, both the second and first type error decrease as manifestation of the event approaches and, in particular, the first type error decreases more than the second type error.

With reference to the Ohlson model (1980), the following emerges (Table 8).

Table 8. Results of the Ohlson model (1980)

Models	Sample of non-failed companies		Sample of failed companies		Overall sample
	% non-failed correctly predicted	Second Type Error	% failed correctly predicted	First Type Error	% correct predictions
Ohlson 3-year prediction	64.87%	35.13%	34.46%	65.54%	64.67%
Ohlson 2-year prediction	67.87%	32.13%	36.03%	63.97%	67.67%
Ohlson 1-year prediction	67.14%	32.86%	66.06%	33.94%	67.14%

The Ohlson model (1980), like the Taffler model (1983) but unlike the Altman model (1983), does not comprise a grey area, i.e. an area of uncertainty in the classification. In the 3, 2 and 1 year prediction, the following emerges: for the sample of non-failed companies, the second type error assumes lower values than Taffler (1983); for the sample of failed companies, the first type error assumes much higher values than the Altman model (1983), since the latter does not comprise a grey area. With particular reference to the 1-year prediction, for the sample of failed companies, the first type error assumes higher values than the Altman model (1983), but approximately 50% lower than the 3 and 2-year prediction. In short, both the second and first type error decrease around 1 year prior to manifestation of the event. In addition, the first type error decreases more than the second type error. With respect to the Altman model (1983) (which benefits from the grey area, i.e. uncertainty in the estimate), the Taffler model (1983) is more frequently subject to first type error, whereas the Ohlson model (1980) is characterised by fewer second type errors.

Limiting the analysis to the most significant sectors in terms of failed companies (i.e. those that comprise a considerable number of failed companies), the following differences emerge with respect to the results obtained applying mode a) to the entire sample:

– in the Manufacture sector, an increase in the effectiveness of the models in the 3, 2 and 1 year prediction emerges;

– in the Construction activities, a reduction in the prediction effectiveness of the models emerges, with the exception of the 1-year prediction of the Altman model (1983);

– in the Trade sector, a greater effectiveness of the Altman model (1983) and Taffler model (1983) emerges and a lesser effectiveness of the Ohlson model (1980);

– in the Real estate activities, an increase in the prediction effectiveness of the models is observed, with the exception of the Taffler model (1983) at 1 year, which has a substantially identical effectiveness;

– in the Transport and warehousing sector, the Altman model (1983) highlights an increase in effectiveness of the 3, 2 and 1 year prediction, while for the Taffler model (1983) and Ohlson model (1980) there is an increase in effectiveness of the 2 and 1-year prediction and a reduction in the 3-year prediction. In particular, in the 3-year prediction, the Ohlson model (1980) does not show a good predictive capacity;

– in the sector of Professional activities, the effectiveness of all the models improves as the insolvency event approaches, with the exception of the Ohlson model (1980) in the 3-year prediction.

5.2 Application mode b)

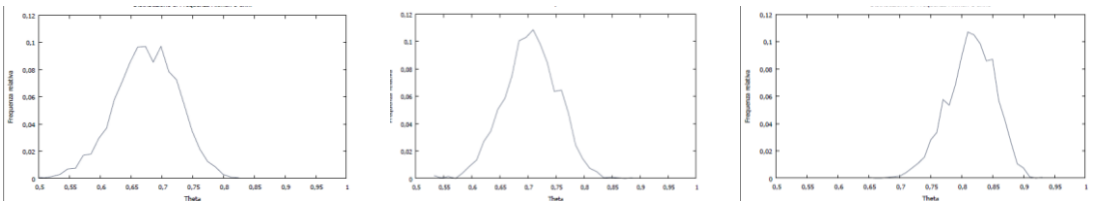
The following tables show the results of the individual models. The results for the three models are given in Table 9.

Table 9. Results of application mode b)

Model	Mean	Median	Std. Dev.	Skewness	Excess kurtosis	Jarque-Bera
Altman 3-year prediction	67.46%	67.57%	0.051	-0.267	0.121	23.574
Altman 2-year prediction	70.51%	70.60%	0.048	-0.114	0.082	4.641
Altman 1-year prediction	81.50%	81.77%	0.038	-0.343	0.018	45.936
Taffler 3-year prediction	67.80%	67.98%	0.051	-0.191	0.151	12.297
Taffler 2-year prediction	71.65%	71.86%	0.048	-0.116	-0.251	11.647
Taffler 1-year prediction	77.96%	78.01%	0.044	-0.122	0.100	5.347
Ohlson 3-year prediction	58.35%	58.31%	0.052	-0.049	-0.084	1.328
Ohlson 2-year prediction	62.58%	62.64%	0.051	-0.115	-0.049	4.922
Ohlson 1-year prediction	76.16%	76.27%	0.042	-0.208	0.127	14.276

With reference to the Altman model (1983), these results are in line with those obtained by applying mode a), confirmed by the mean of the results obtained from the different applications of the above model 3, 2 and 1 year prior to manifestation of the insolvency event (Figure 4).

Figure 4. Frequency distribution at 3, 2 and 1 years for Altman (1983)

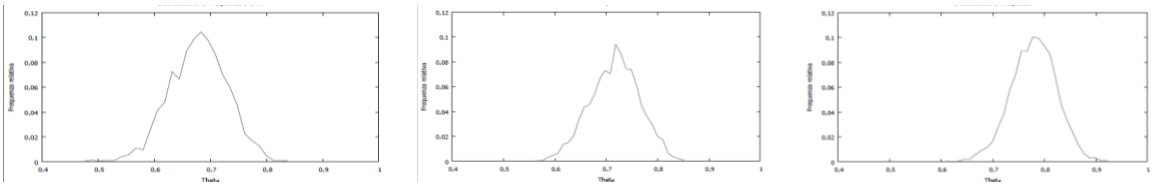


3 years 2 years 1 year

It emerges that the cases in which the effectiveness of the model is a long way from the mean behaviour occur less frequently in the 1-year prediction than in the 3 and 2-year prediction.

Also with reference to the Taffler model (1983), the results are in line with those obtained by applying mode a), confirmed by the mean of the results obtained from the different applications of the above model 3, 2 and 1 years prior to manifestation of the insolvency event (Figure 5).

Figure 5. Frequency distribution at 3, 2 and 1 years for Taffler (1983)

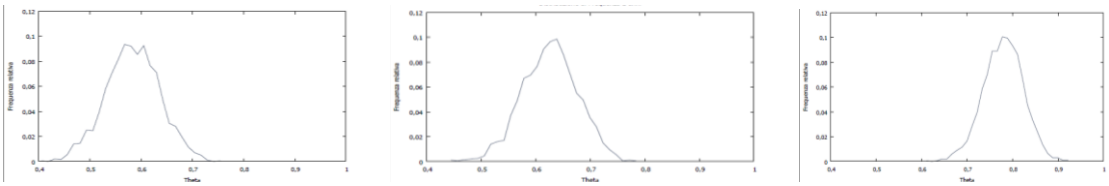


3 years 2 years 1 year

It emerges that the cases in which the effectiveness of the model is a long way from the mean behaviour occur less frequently in the 1-year prediction than in the 3 and 2-year prediction. The same considerations also apply to the cases in which the models' prediction capacity is higher than the mean.

Also with reference to the Ohlson model (1980), it emerges that the results are in line with those obtained by applying mode a), confirmed by the mean of the results obtained from the different applications of the above model 3, 2 and 1 years prior to manifestation of the insolvency event (Figure 6).

Figure 6. Frequency distribution at 3, 2 and 1 years for Ohlson (1983)



3 years 2 years 1 year

It emerges that the Ohlson model predicts fairly well 1 year from manifestation of the event and not as well over longer prediction horizons (2 and 3 years).

After individually observing the results of the above models, it emerges that the models are more accurate at around one year prior to the insolvency event.

Applying the models according to mode b) only to the firms operating in the Manufacture sector, for the Altman model (1983) and the Taffler model (1983) an increase in prediction effectiveness occurs both in the 1-year prediction and in the prediction 2 and 3 years prior to occurrence of the default, while for the Ohlson model (1980) there are no significant variations in terms of effectiveness.

5.3 Application mode c)

The results are shown in the following table (Table 10).

Table 10. Results of application mode c) for Altman (1983)

Models	Sample of non-failed companies			Sample of failed companies		
	% non-failed companies correctly predicted	% companies in grey area	Second Type Error	% failed companies correctly predicted	% companies in grey area	First Type Error
Altman 3-year prediction	20.75%	52.83%	26.42%	73.58%	24.53%	1.89%
Altman 2-year prediction	18.87%	41.51%	39.62%	73.58%	20.75%	5.67%
Altman 1-year prediction	20.75%	39.62%	39.63%	79.25%	16.98%	3.77%

With reference to the errors made, it emerges that both the first type error and second type error decrease around one year prior to manifestation of the event.

With reference to the Taffler model (1983), the following emerges (Table 11).

Table 11. Results of the Taffler model (1983)

Models	Sample of non-failed companies		Sample of failed companies		Overall sample
	% non-failed companies correctly predicted	Second Type Error	% failed companies correctly predicted	First Type Error	% correct predictions
Taffler 3-year prediction	47.17%	52.83%	88.68%	11.32%	67.92%
Taffler 2-year prediction	47.17%	52.83%	86.79%	13.21%	66.98%
Taffler 1-year prediction	47.17%	52.83%	94.34%	5.66%	70.75%

The Taffler model (1983), unlike the Altman model (1983), does not comprise a grey area (i.e. an area of uncertainty in the classification). The following emerges in the 3, 2 and 1-year prediction: for the sample of non-failed companies, the first type error assumes high values with respect to the Altman model (1983), since the latter does not comprise a grey area; for the sample of failed companies, the first type error assumes higher values than the Altman model (1983). In short, the first type error decreases around one year prior to manifestation of the event, while the second type error remains constant.

With reference to the Ohlson model (1980), the following emerges (Table 12).

Table 12. Results of the Ohlson model (1980)

Models	Sample of non-failed companies		Sample of failed companies		Overall sample
	% non-failed companies predicted correctly	Second Type Error	% failed companies predicted correctly	First Type Error	% correct predictions
Ohlson 3-year prediction	81.13%	18.87%	41.51%	58.49%	61.32%
Ohlson 2-year prediction	81.13%	18.87%	43.40%	56.60%	62.26%
Ohlson 1-year prediction	75.47%	24.53%	75.47%	24.53%	75.47%

The Ohlson model (1980), unlike the Altman model (1983). In the 3, 2 and 1-year prediction, the following emerges: for the sample of non-failed companies, the second type error assumes lower values than Taffler (1983); for the sample of failed companies, the first type error assumes much higher values than the Altman model (1983), since the latter does not comprise a grey area. In particular, in the 1-year prediction, for the sample of failed companies, the first type error assumes higher values than the Altman model (1983), but approximately 50% lower than the 3-year and 2-year prediction. In short, both the second type error and the first type error decrease around one year prior to manifestation of the event; in particular, the first type error decreases significantly.

Compared to the Altman model (1983), the Taffler model (1983) is more subject to first type

error, while the Ohlson model (1980) is characterised by a more limited second type error.

Applying the models according to mode c) only to the firms operating in the manufacturing sector, for the Altman model (1983) a reduction occurs in the percentage of non-failed firms correctly predicted, while the percentage of failed firms correctly identified significantly increases. For the Taffler model (1983) an increase occurs in the percentage of non-failed companies correctly identified and failed companies correctly identified, with the exception of the percentage of correct identification of the failed companies one year prior to the default event which remains unchanged. For the Ohlson model (1980) an increase occurs in the percentage of non-failed firms correctly identified, but the percentage of correct identification of the failed firms decreases.

6 Conclusions, implications and limitations of the research

Application of the models of Altman (1983), Taffler (1983) and Ohlson (1980) repeated on the three sample sizes (mode a), mode b) and mode c)) enables us to reach the following conclusions for each individual mode.

As regards application mode a), the use of the ROC Curve highlights that the above models have a greater effectiveness around one year prior to manifestation of the insolvency event; furthermore, it emerges that the discriminant analysis models are more effective. One year prior to manifestation of the event, the Altman model (1983) is the one that performs best, followed by the Ohlson model (1980). In addition, using the points chosen by the same authors as cut-off points, the following emerges:

– the Altman model (1983) has two cut-off points for classification of the companies into non-failed companies, failed companies and companies belonging to the grey area (i.e. companies for which the model is not able to specify whether they are or are not in a situation of insolvency). However, with reference to the companies belonging to the grey area, Altman himself hypothesised that they may be companies (if non-failed) which are in a situation of insolvency which has not yet been manifested externally;

– the Taffler model (1983) and the Ohlson model (1980) only have one cut-off point for classification of the companies into non-failed companies and failed companies, i.e. these models do not comprise an area of uncertainty.

The Altman model (1983) shows a lower first type error (i.e. classification of a failed company as non-failed), comparing the results with the Taffler model (1983), which does not comprise a grey area. However, if we considered also the companies falling within the grey area, the Altman model (1983) would have a higher number of failed companies erroneously classified as non-failed, compared to the Taffler model (1983). The first type error in the Ohlson model (1980) significantly decreases the year prior to manifestation of the event, but remains higher than in the Taffler model (1983). With reference to the second type error (i.e. classification of a non-failed company as a failed company), the Ohlson model (1980) shows lower values than the multivariate discriminant analysis models. It should be reiterated that, although the Altman model (1983) comprises an area of uncertainty, the second type error is lower than the Taffler model (1983), but higher than the Ohlson model (1980).

In general, it emerges that the models of Altman (1983) and Taffler (1983) are more conservative, i.e. they predict the default of a higher number of companies than actually found. If the model is used to take decisions (for example, in the case of granting of a loan by a bank), it would entail a reduction in the "potentially" reliable companies, with a high degree of certainty concerning the probable solvency of the reliable companies.

As regards application mode b), the results obtained are coherent with the conclusions for mode a). In particular, each model is more effective in prediction at 1 year than in the prediction at 3 and 2 years prior to the event. Comparing the models, it can be seen that the discriminant analysis models are more effective than the Logit model in the 3 and 2 year prediction, while in the 1-year prediction the gap between the effectiveness of the models narrows significantly.

Generally speaking, the models are more effective the nearer the event gets; the Altman model (1983) is more effective than the other models taken into consideration.

As regards application mode c), the results obtained by mode a) are generally confirmed. The trend of the first and second type errors for the different models follows the general trend, i.e. these errors decrease in the prediction one year prior to manifestation of the event. Given that the two samples contain the same number of companies, it is observed that the discriminant analysis models commit fewer first type errors than second type errors in all three years observed. Furthermore, the Logit analysis model shows fewer second type errors than first type errors for the 3 and 2-year prediction, committing equivalent first and second type errors in the prediction 1 year prior to the event. It is also observed that, given the sample identified, the Altman model (1983) is more effective than the Taffler model (1983) and Ohlson model (1980). In the Altman model (1983), there are fewer first and second type errors than in the other models, due also to the provision of an area of uncertainty. What is noticeable, in accordance with the results obtained throughout the sample, is the lesser second type error in the Ohlson model (1980) when compared with the Taffler model (1983), neither of which have an area of uncertainty.

With reference to all the application modes, it is observed that, for all the models, the error committed in the prediction of default (classification of the company as failed) of a company which is solvent (and should therefore classified as non-failed) is high. On the other hand, the failed companies are classified with a lower degree of error (with the exception of the Ohlson model (1980)). Furthermore, the model could anticipate for some companies the occurrence of a state of insolvency in the years after 2012, emphasising its value as an indicator of an approaching insolvency situation.

The study has a number of theoretical and practical implications. The theoretical implications are connected with development of the research (currently in progress) in order to introduce correctives into the models aimed at increasing their effectiveness. These correctives could be:

a) an "update" of the traditional models (discriminants and Logit). This working hypothesis consists in using the original model, updating it (with reference to the weights of the variables and the cut-off points) in relation to the sample used in this research contribution. In fact, this sample is different from the authors' original one;

b) an "adaptation" of the traditional models (discriminants, logit and regressive). This working hypothesis consists in using the original model and integrating it with some variables that can make a significant contribution to improving their performance. In other words, the variables used by the authors are integrated/replaced by other variables.

As regards "updating" of the models:

i) in Altman (1983) and Taffler (1983), it is known that the weights of the variables, like the cut-off points, have been calculated by the authors on the basis of the samples used by them. The model according to its original configuration was applied to the sample used in this study, providing the results described in the previous pages. It is hypothesised that the performance of the model can be improved if its weights and cut-off points are modified, recalculating them with reference to the sample used in this study (update). This update will be developed as follows:

– using the sample of companies used in this research instead of the sample originally used by Altman and Taffler;

– starting from the original model (with reference to the variables that compose it), the use of a different sample involves recalculation of the weights which each variable assumes in the model. The model would be applied on the basis of the new weights;

– via application of the model with the new weights, the cut-off points for classification of the non-failed and failed companies would be recalculated;

– on the other hand, it would appear that the qualitative type variables appropriately transformed into quantitative variables cannot be used in these models (Knoke,1982); Tabachnick and Fidell, 2012);

ii) in the Logit models, the model will be updated using the sample of this study (different from the one used by the authors), via the same methodological steps as those used in the models of Altman (1983) and Taffler (1983).

As regards "adaptation" of the traditional models (discriminants, logit and regressive), the work programme is to add/modify some variables in the original configuration of the models. The objective is to test the influence of some non-accounting variables (quantitative or qualitative) on the performances of the models. The non-accounting variables considered could be those that are structured and available to parties outside the companies (such as the macroeconomic variables, the sector information, etc.). Other variables could be of a non-structured type and typically not known to parties outside the company (such as the management quality, the presence of independent directors, the presence of management control systems, the R&D activity, etc.).

The practical implications of the research derive from the fact that the ability to effectively predict the manifestation of a situation of company insolvency has emphasised the role of the prediction models for the parties who, in various ways, have or will have expectations in terms of the company's results (banks, suppliers of goods and services and other stakeholders). The new characteristics of company insolvency, on the one hand, and the general ineffectiveness of the prediction models (especially in relation to second type errors), on the other, are stimulating the scholars to identify a series of correctives to the traditional models in order to make them more performing.

The study has a number of limitations, namely:

– the difficulty of accurately identifying the failed companies, since there may be a large number of failed companies but without external evidence of an insolvency situation, hence they are not correctly placed in the sample;

– the number of failed companies has been considerably reduced due to non-availability of the financial statements for all the years involved in the analysis.

These research limits are balanced by a series of strengths of the analysis carried out, represented by the numerousness of the sample considered, and the identification of different application modes.

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