

**RELATIONSHIP BETWEEN BOARD CHARACTERISTICS AND
FIRM FINANCIAL DIVERSIFICATION (NATIONAL SALES
AND ASSETS) AMONG LISTED FIRMS ON NAIROBI
SECURITIES EXCHANGE, KENYA**

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Abstract

Empirical studies have shown that top management observable characteristics' have different outcomes on firm performance. Previous studies on board diversity and firm diversification have concentrated on large sized firms in America, Western Europe and Asia with no conclusive evidence on the relationship between board characteristics and firm diversification. Due to differences in country specific factors and level of market development, this study was an attempt to fill this gap by utilizing a 10 year Panel data of thirteen listed firms on Nairobi Securities Exchange- Commercial and Manufacturing sectors. Feasible Generalised Least Squares fixed and random effect models were used to estimate the parameters used to test study hypotheses. Hadri residual-based Lagrange multiplier test was used to determine the feasible model. Results revealed that, gender, experience, and nationality diversities to be significant determinants of firm diversification within Kenya. Agency, Resource Based View and upper echelon theories provided theoretical framework for the study. Longitudinal research

design was used in the study. This study is a behavioural compliment contribution to the more convectional financial dimensions of firm performance (ROE, ROI and EPS) in Kenya. Further research may be conducted to examine the relationships between board demographics, macro-economic factors and firm level of diversification.

Keywords: listed firms, national segments sales, national segments assets, Diversification, board characteristics

INTRODUCTION

Researchers globally have done several studies testing different aspects of diversification on the firm's value. Lung and Stultz 1994; Berger and Ofek 1995 asserts that firms operating in multiple lines of business are valued less than comparable focused firms thus diversification has been observed to have value destruction. Lamont and Polk (2001) offered an alternative approach to causal effects of diversification and argue that firm's diversification status can change even if the firm does not change it on purpose and as such exogenous change in diversification is plausibly independent of a firm's behaviour. Varadarajan and Ramanujam (1989) defined diversification as the extent to which firms are simultaneously active in many different businesses.

Fluck and Lynch (1999), show that diversification is a way to finance a project that otherwise could not be financed by outside financial markets as stand-alone entries. Matsusaka (2001) asserts that firms diversify to search for a better match between their organizational and industrial opportunities. Maksimovic and Philips (2002) established that firms optimally choose organizational structures depending on their comparative advantages. Gomes and Livdan (2004) through their model demonstrate that diversification allows corporations to explore synergies and better production in response to current decline in performance. Lewellen (1971), suggest that diversified firms achieve a higher debt capacity hence giving additional interest tax shields. Rajan *et al.*, (2000) observes that diversification strategies allow managers to divert resources to inefficient division and that agency theory predicts that firm value would be destroyed if managers endogenously increase the degree of diversification.

Campa and Kendia (2002) show that there are significant differences between firm characteristics that cause firms to adopt various types of organizational structures. Del Brio *et al.*, (2011) posit that corporate diversification is associated with lack of alignment between ownership and control, and the failure of control mechanisms. Jensen and Zajac (2004) argue that in USA corporations, individual characteristics of corporate elites may imply different

preferences for particular corporate strategies such as diversification and acquisitions, these basic preferences, when situated in different agency contexts (e.g., CEO, outsider director, non-CEO top management team member), generate very different strategic outcomes. Similarly the study of Sambharya (1996) posits that TMTs with higher mean international experience and greater heterogeneity of foreign experience were associated with the firm's geographic diversification.

The Kenyan Capital Market is part of the financial market that provides funds for long-term development. Firms trading at NSE are regulated by the Capital Markets Authority (CMA) which is an independent public agency charged with the responsibility of regulating and facilitating the development of orderly, fair and efficient capital markets in Kenya (CMA Act, 2012). Over the years CMA has endeavored to develop critical aspects that include: creation of a nationwide system of stock market and brokerage services for wider participation of the public, creation of efficient securities market, protection of investor interests, as enshrined in CMA amendment Act, (2012).

KNBS (2009), posit that the Capital Market performance experienced a downturn in 2008 with NSE share index losing 1,924 points by the end of 2008. It is, however, notable that capitalization in the equities market rose to over a trillion Kenya shillings (\$95, 238 billions) following the IPO of Safaricom ltd in the second quarter of 2008 but declined to Kenya Shillings 854 billion at the end of the fourth quarter. The total bond turnover rose by 12.4% to Kenyan shillings 95.4 billion in 2008 compared to Kshs 84.9 billion in 2007. Over the years some policy measures have been instituted through the budget aimed at deepening the Capital Markets as well as strengthening CMA supervisory capacity, enhancement of corporate governance among the financial market players as well as reducing cost for listed companies. In addition, during the period 2004 – 2008 foreign participation which historically has been of net inflows, changed to net out flows. KNBS, statistical abstract (2012) indicate that the NSE share index from the year 1997 – 2011 on month to month basis, has been fluctuating with a high of 5,774.24 January 2007 and a low of 1,027 September 2002. Further, some of the privately and publicly owned firms' have had both operational and financial difficulties caused by Principal-principal conflict and Principal- Manager Conflict (case of CMC Kenya, Access Kenya, Eveready and Uchumi Supermarkets).

Kenya Financial Sector Stability Report (KFSSR,2013), indicate that the Kenyan banking sector liquidity exceeded the statutory requirement of 20% with gross loans to deposits ratio being 73.3% in 2008 to 81.1% in 2013. The banking sector has neither been spared with National Bank of Kenya having remained unprofitable for 12 years and a dry spell of dividends pay-out attributable to uncontrolled investments decisions. Accordingly, industry statistics,show

that about 10% of adult Kenyan own shares in the country's Securities market which translate to about 2 million Kenyans. This figure is lower than that of the USA where up to 48 per cent of the adults have invested in stocks and government papers, in Australia the figure is estimated to be about 40 per cent and in Sweden and Switzerland, 30 per cent of the adults have put their money in securities. According World Economic Outlook Update (WEOU, 2014), indicate that Sub Saharan Africa Emerging economies had an average growth rate of 5.8% between 2004 - 2008, slowed to 2.5% in 2009 and closed at 5.0% in 2014. Institute of Economic Affairs survey (2012) reveal that Real Growth Domestic Product (RGDP) for Kenya grew from 1.5% in 2008 to 2.7% in 2009 with a high of 4.6% in 2012 and that RGDP per capital was low at 36933 in 2008 and a high of 39607 in 2012. The various sectors of the economy have equally posted mixed growth rates between the years 2008 and 2012. Manufacturing sector registered highest growth rate of 4.5% in 2010 and a low of 3.1% in 2012, transport and commercial sector, financial sector, and Agricultural sector registering average growth rates of 4.8%, 6.4%, and 1% respectively between 2008 and 2012.

Empirical studies revealed that previous studies have concentrated on the relationship between board diversity and firm performance majorly in USA, Asia and Europe large sized firms (,and Shireejit; 2009, Letting *et al.*, 2012, Laeven and Levine, 2007, Stephen,*et al.*, 2010) among others. This study therefore examined the relationship between board demographics and firm diversification in listed firms at NSE, an emerging market focusing on two-dimensional perspectives: the sales revenue generated by various business segments and investments in segments assets within Kenya. This study is different from previous studies on the basis of sectors chosen, period of the study and method of data analysis.

Mishra and Shital (2012) view board characteristics as the heterogeneous composition of the board in terms of gender, age, race, education, experience, nationality, lifestyle, culture, and religion as those facets that make us different. Studies of Miller (2009), Antonio (2008) and Wan (1998), Webb (2004) have all argued in a favour of board diversity in relationship to gender and ethnicity to be having a positive relationship with firms return on assets, and investment in US companies. Similarly, Bear *et al.*, (2010) established that corporate reputation is positively impacted by the number of women on boards. This view is also supported by Gary *et al.*, (2010) and Hermalin and Weisbach (1991) that women directors influence on firm's profitability and shareholder value is dependent on company specific circumstances. Similar studies of Carter *et al.*, (2010) Wan and Hoskisson (2003), established that gender and ethnic diversity in the US firms do not have any significant impact on company financial performance measured by ROA and Tobin Q. Hambrick and Masons (1984) posit that observable demographic attributes shape values and beliefs of individual managers and can be seen as valid proxies for underlying

cognitive abilities, values and experience which in turn substantially impact decision making and behaviour of the board members this arguments upheld RBV and Upper Echelon Theory of the firm.

THEORETICAL FRAMEWORK

This study relied on four theoretical frameworks perspectives of the firm: Agency Theory, free cash flow hypothesis, Resource Based view theory and upper echelon theory to provide explanation of relationship between board characteristics' and firm diversification for listed firms' in the selected sectors in Kenya. The directors are associated with negligence and profusion, and, more or less, in the management of the affairs of accompany (Jensen and Meckling, 1986). Denis *et al.*, (1999), Shleifer and Vishny (1989) argue that, diversification has been an Agency Cost, representing a manifestation of conflicts of interest between managers and stock- holders as well as a form of manager perquisite with the main motivations being entrenchment of managers, making them more valuable to shareholders and costly to replace. RBV emphasizes on the allocation of resources and sharing of competencies across different business lines to enhance performance by either cost reduction or edging competing firms out of the market (Porter, 1980). This exploitation of potential synergies expected from sharing functions lead to generation of sustainable competitive advantages hence profitability accustomed by cost reduction. RBV predicts a positive relationship between diversification and firm's financial performance (Mwau, 2015, Porter, 1980).

According to upper echelon theory, TMTs background, experiences, and values of corporate executives influence important corporate information. Observable characteristics such as age, tenure, and functional experience might serve as useful proxies for cognitive base that guide top executive decisions. Lawrence (1997) asserts that demographic variables are often used as proxies in subjective concepts and researchers relying on demographics characteristics apply a congruence assumption. Brush, *et al.*,(2000) argue that insituations of weak corporate governance, managers use substantial free cashflows to fullfill their own needs, rather than those of shareholders. Chatterjee and Wernerfelt (1991) argue that availability of internal funds or unused debt capacity favours higher levels of diversification.

Statement of the Problem

Corporations worldwide diversify for a host of reasons. In some cases, it is a survival strategy while in other cases they do so to ensure a regular revenue stream throughout the year. Matsusaka (2001) asserts that firms diversify to search for a better match between their organizational and industrial opportunities. Kenya Financial Sector Stability Report (2013)

reveals that, NSE performance between 2008 and 2013 registered mixed results across key sectors of the economy, with equity turnover for (2013) grew by 79.4%, year- on- year to Kshs.155.7 billion on account of increased local and foreign investor participation with foreign investors accounting for 59.2% of the equity purchases and 43.6% of equity sales.

The performances of the various sectors of the economy are driven by a set of variables that are multidisciplinary in nature affecting various investments strategies undertaken by listed firms with varying degrees. Commercial and Manufacturing sectors has a total of 20 firms 'each with both local and foreign based operations. The sectors consist of the most promising investments segment appealing for both local and foreign investors. The firms have diversified across the country and region. Kenyan firms in the commercial and manufacturing have diversified into Rwanda, Uganda, Tanzania and Southern Sudan while others offer logistical, transport and freight services and goods across Africa Continent and beyond. The firms in commercial and manufacturing sectors have suffered from a raft of factors particularly, regional insecurity, high profile domestic attacks, economic crisis (global financial meltdown, 2008), rising levels of corruption and recently misconceptions about the spread of Ebola in West Africa. These factors have served to keep international tourist arrival low, as well as precipitate threats of closure of subsidiaries disrupting revenues streams, assets utilization and displacement of human resources (KFSSR, 2013).

Retail businesses have incurred high operational costs arising from Principal-principal conflict and Principal- Manager Conflict (Uchumi Supermarket, delisted in 2006 and re-listed in 2011) and currently in cash flow problems with a record loss of Kshs. 3.7 billion (US \$ 35,238 Millions) in 2014/2015 financial year. Irrecoverable investments losses at Kenya Airways (Annual Report, 2012,2013,) in addition to poor investments in fuel derivatives at much higher prices than their fair values. A record loss of Kshs. 7.9 billion (US \$ 75,238 Millions) after tax in the financial year 2013-2014 attributable to poor marketing, overpricing of tickets, and unsustainable debt levels with Kenyan Senate in its report to parliament questioning the competence of board members (Standard, Dec 3rd 2015). Equally, Media, Marketing and other logistical firms within the Commercial sector share the global financial crisis due to its impact on the purchasing power of their respective market segments. In the manufacturing sector, Mumias Sugar Company, Eveready East Africa, and B.O.C (K) have had several cash flow problems and requiring intervention of the regulator.

In spite of these challenges, all the firms in the sector continue to either operate multiple business segments or spread geographically offering diverse product lines. The decisions to diversify are majorly undertaken by firms' board of directors as the governance body on behalf of the shareholders in pursuit of wealth maximization. Such decisions are consequential

judgement that requires careful review and consideration of a mapping of firm characteristics and environmental scanning for custodial role of the board. Though diversification allows a firm to take advantage of economies of scale, arbitrage across factor markets, leverage market power to reduce input costs and as well as control output markets and spread of market risks, it does present considerable ambiguities, complexities and risks. The associated challenges require a set of rational and objective cognitive abilities, orientation and competencies among board members in decision making regarding diversification strategies. This study sought to establish relationship between board characteristics and firm diversification for firms listed at the NSE, Kenya, and in particular, commercial and Manufacturing sectors. The board members were chosen on the basis that managerial responsibilities are rarely exclusive domain of a single person (CEO), (Hambrick and Mason, 1984). The findings of the study extended and mirrored some prior studies in the literature review and its implication on theory and policy regarding board diversity and firm diversification.

General Objective of the Study

The major objective of the study was to determine the relationship between board characteristics and firm financial diversification in firms listed on Nairobi Securities Exchange, Kenya.

Specific Objectives of the Study

1. To determine the relationship between gender diversity and firm diversification.
2. To determine the relationship between board tenure diversity and firm diversification.
3. To determine the relationship between board experience diversity and firm diversification.
4. To determine the relationship between board interlock directorship diversity and firm diversification.
5. To determine the relationship between nationality diversity and firm diversification
6. To determine the relationship between directors' remuneration and firm diversification

Research Hypotheses

H_{01} : Board gender diversity has no significant relationship with firm diversification.

H_{02} : Board tenure diversity has no significant relationship with firm diversification.

H_{03} : Board experience diversity has no significant relationship with firm diversification.

H_{04} : Board interlock directorship diversity has no significant relationship with firm diversification.

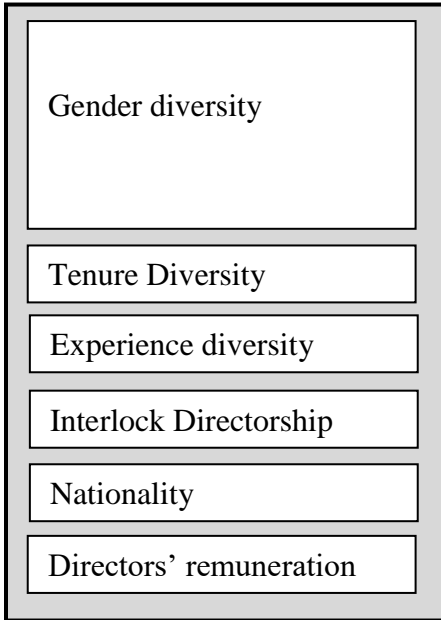
H_{05} : Board Nationality diversity has no significant relationship with firm diversification.

H_{06} : Board remuneration has no significant relationship with firm diversification

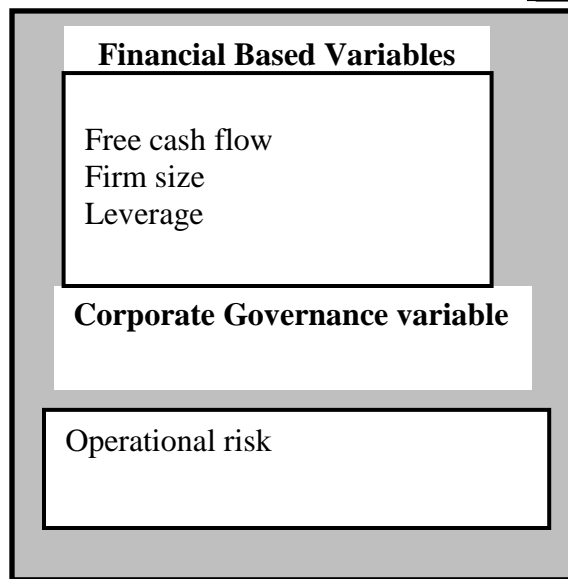
Figure 1: Conceptual Framework

Independent variables

Board Characteristics

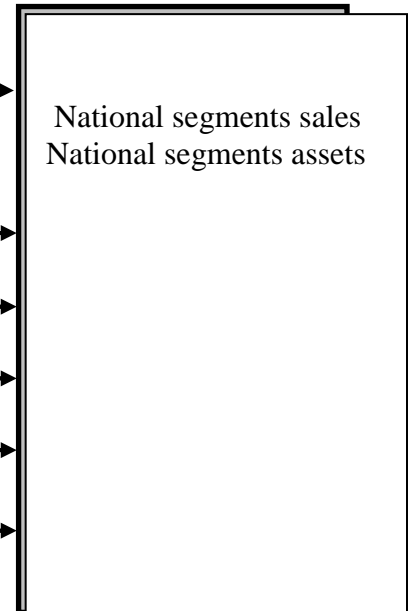


Control Variables



Dependent variable

Firm diversification



D

This study conceptualized that board characteristics influences firm diversification among listed firms on NSE, Kenya. The literature reviewed guided on the selection of independent and dependant variables. Researcher hypothesizes on each of the characteristics pointing out expected relationship as summarized in table 2. Firm size, leverage ,free cash flows were used as indirect measures of firms ability to pursue diversification, while operational risk was used to measure board of directors attitude to words risk.

Diversification concept

Diversification was measured from two general perspectives within the country (nationally). The first dimension was on the basis of firm sales traceable directly to multiple lines of products or segments within the country. National assets was proxied by the value of investments in segments assets within the country (Wan 1998; Linet *et al.*, 2005).

The control variables for the research were categorized into two. The first category consisted of firm based financial characteristics that included; firm size measured as logarithm of sales, (Anderson *et al.*, 2000, RamaSwamy, *et al.*,2002), free cash flow was measured as a ratio of current assets to total assets, Leverage measured as a ratio of debt to total assets (indicator of solvency level, Ryan, 2013). The control variables were indirect measures of the firms' ability to undertake diversification.

METHODOLOGY

Research Design

Longitudinal design was used in the study. The design is suitable in tracking changes over time and to relate them to variables that might explain why the changes occur. It is capable describing patterns of change and help establish the direction and magnitude of causal relationships and as well as the prediction of future outcomes based upon earlier. The study targeted a sample of 18 listed firms on NSE under category of Commercial and Services and Manufacturing sectors. Complete information was available on 13 firms for the period 2004 to 2014 bringing a total of 130 observations. This period was considered suitable for the study since it was characterized by increased domestic demand, modest growth in credit, notable positive growths in manufacturing and commercial services, increased equity capitalization and stable macroeconomic environments (KNBS, 2014). The selected sectors consisted of firms that had both local and foreign operations with diverse lines of products or services, largest investments in assets, and high sales volume. The sectors in addition had sufficient information on end-of- financial year common equity, total debt, total sales, assets and liabilities, and information relating to board of directors gender, experience, tenure, Nationality, interlock

boards functionality and directors' remuneration. The study relied on secondary data obtained from audited annual accounts. Sanni and Abdifatah (2014) asserts that annual accounts have high degree of credibility, are reviewed by a wider population of the community, and regarded as important communication mechanisms to external users over which management has editorial control. Panel data approach allows the testing and adjustments of assumptions that are implicit in cross-sectional analysis (Maddala, 2001)

Selection of Estimation Method

Having confirmed the presence of unit roots, the previous research and utilizing Hadri (2000) a residual-based Lagrange multiplier (LM), generalised least squares (GLS) fixed effect and random effects was found suitable for the data. GLS has the advantage of powerful assumptions about homoskedasticity and no serial correlation that is common in Pooled Ordinary Least Squares (Wooldridge, 2012,2002 and Ujunwaet *al.*, 2012). GLS assumes that regression parameters do not change over time and do not differ between various cross sectional units, thereby enhancing the reliability of coefficients estimates (Gaur and Gaur,2006). Diversification was the dependent variable measured from two perspectives: the value of sales traceable to business segments within the country (Kenya) and the value of investments in assets traceable to business segments within the country.

Following Hadri (2000) and SPPS test, the regression model was derived from the following procedure following two equations:

$$Y_{it} = R_{it} + \varepsilon_{it} \quad i = 1,2,\dots,N; t = 1,2,\dots,T \quad \dots\dots\dots (1.1)$$

And

$$Y_{it} = R_{it} + \beta_i t + \varepsilon_{it} \quad i = 1,2,\dots,N; t = 1,2,\dots,T \quad \dots\dots\dots(1.2)$$

Where $R_{it} = R_{i,t-1} + \mu_{it}$ is a random walk $\varepsilon_{it} \sim IIND(0, \sigma_\varepsilon^2)$ and $\mu_{it} \sim IIND(0, \sigma_\mu^2)$ are mutually independent normal that are IID across i and over t . Back substitution was used to get the following model that was estimated;

$$Y_{it} = R_{i0} + \beta_i t + \sum_{s=1}^t \mu_{is} + \varepsilon_{it} = R_{i0} + \beta_i t + v_{it} \quad \dots\dots\dots (1.3)$$

Where $v_{it} = \sum_{s=1}^t \mu_{is} + \varepsilon_{it}$. The stationarity hypothesis was $H_0 : \sigma_\mu^2 = 0$ in which $v_{it} = \varepsilon_{it}$

The LM statistic given by

$$LM_1 = \frac{1}{N} \left(\sum_{i=1}^N \frac{1}{T^2} \sum_{t=1}^T S_{it}^2 \right) / \hat{\sigma}_\varepsilon^2 \dots\dots\dots (1.4)$$

Where $S_{it} = \sum_{s=1}^t \hat{\varepsilon}_{is}$ were the partial sum of OLS residuals $\hat{\varepsilon}_{is}$ from equation (1.4) and $\hat{\varepsilon}_\varepsilon^2$ is a consistent estimate of σ_ε^2 under the null hypothesis H_0 (Greene, 2012). A possible candidate is;

$$\hat{\sigma}_\varepsilon^2 = \frac{1}{NT} \sum_{i=1}^N \sum_{t=1}^T \hat{\varepsilon}_{it}^2 \dots\dots\dots (1.5)$$

To allow for Heteroscedasticity the procedure that was suggested by Hadri (2000) was used. The alternative Lagrange multiplier(LM) test that allowed for heteroskesdacity across i , for instance $\sigma_{\hat{\varepsilon}_i}^2$ was as follows:

$$LM_2 = \frac{1}{N} \left(\sum_{i=1}^N \left(\frac{1}{T^2} \sum_{t=1}^T S_{it}^2 / \hat{\sigma}_{\hat{\varepsilon}_i}^2 \right) \right) \dots\dots\dots (1.6)$$

The test statistic was given by $Z = \sqrt{N(LM - \xi_1) / \zeta}$ and is asymptotically distributed as $N(0,1)$ where $\xi = 1/6$ and $\zeta = 1/45$ if the model only includes a constant and $\xi = 1/15$ and $\zeta = 11/6300$ otherwise (Wooldridge, 2012, Newey and West, 1994).

In order to fit the parameters used to explain the dependent variable and with appropriate transformations, equations 1.7 and 1.8 were finally used.

$$Y_{1it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \beta_5 X_{5it} + \beta_6 X_{6it} + \beta_7 X_{7it} + \beta_8 X_{8it} + \beta_9 X_{9it} + \beta_{10} X_{10it} + \varepsilon_{it} \dots\dots\dots (1.7)$$

$$Y_{2it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \beta_5 X_{5it} + \beta_6 X_{6it} + \beta_7 X_{7it} + \beta_8 X_{8it} + \beta_9 X_{9it} + \beta_{10} X_{10it} + \varepsilon_{it} \dots\dots\dots (1.8)$$

Where:

- Y_{1it} = Diversification due to national sales is,
- Y_{2it} = Diversification due to national assets,
- X_{1it} = The number of female members on the board,

X_{2it} = The length of stay of a director on the board measured as maximum duration minus minimum duration,

X_{3it} = The number of directors on the board with international orientation in terms of management,

X_{4it} = Interlock directorship measured as the number of board of directors serving on more than one board either intra or extra industry,

X_{5it} = Nationality which was treated as the number of countries represented by the board members,

X_{6it} = Free cash flow measured as the ratio of current assets to total assets,

X_{7it} = Operational risk proxied by the ratio of operational costs to operational income,

X_{8it} = Directors' remuneration measured as the total amount paid to directors in form of fees,

X_{9it} = The size of the firm as logarithm of sales,

X_{10it} = leverage measured as ratio of debt to equity and

ε = stochastic error term assumed to be a white noise process,

t = time trend,

i = cross-sectional units.

ANALYSIS AND FINDINGS

Descriptive Statistics

The first step of the analysis was computation of descriptive statistics presented in table 1. This was done to give pictorial view of the panel data set. The study targeted a total of 18 firms on two sectors commercial services and manufacturing. Complete data was available from 13 firms representing 72.22% of the target population. Experience of board members had an average of 6.3769 international orientations with a maximum of 14. This revealed that the board members had adequate level of experience and were in a position to make informed decisions as regard to firms' products, markets and financial performance. Interlock directorship reported a mean of 5.9077, a maximum of 12 and a coefficient variation of 0.4767. This suggested that majority of the boards of the firms included in the study had the human capital resource with the necessary intra and extra industry experiences and skills that enable them understand the markets dynamics, analyse business environment and expectation of the shareholders, hence able to

guide firms diversification investments and exploitation of various synergies for competitive advantage (Porter, 1980, Teece *et al.*, 1997). This outcome resonated positively with the resource based view perspective of the firm and Upper Echelon theory providing the behavioural tendencies of top managers.

Nationality recorded a mean of 2.9308, maximum of 8 and minimum of 1. It was inferred that majority of board members were coming from different countries and as such provided a network of product and segments investments in their respective countries, insights into business environment besides sharing local experience with their Kenyan counterparts. This findings support prior studies by Marimuthu and Kolandaisamy (2009), Griscombe and Mattis (2002), and Kose and Senbel (1998) who asserts that firms with foreign directors on the board provided a large stock of qualified candidates. This implied that majority of board members had the incentives to cause the firms to grow and managers of such firms had increasing resource power to pursue diversification either in their own interest or those of the shareholders precipitating agency problem (Brush *et al.*, 2010).

Operating risk recorded an average of 1.1725 a maximum of 3.7209 and a minimum of -1.5382. In essence these results meant that the firms' operational revenues were higher than the operational costs suggesting the board members accurately scanned the business risk measure attributable to differences in business environments, business processes and systems. Results also showed the average, and maximum Kshs 79995000(\$761857), Kshs.123,182,900(\$117,317) respectively for director's remuneration. This indicated that directors were adequately compensated and as such pursued diversification in the interest of the shareholders.

The mean of firm size was 15.461 indicating that the sales generated from various business segments encouraged the firms to diversify further within Kenya. Leverage recorded an average of 4257.6 showing that the sampled firms relied on borrowed capital. Further leverage was used as a measure of solvency- firm's ability to sustain debt as it pursued growth strategies within and outside the country. This meant that majority of the sampled firms had solvency ratio above the 20% threshold (Ryan, 2013) hence the sampled firms were considered healthy with minimal default on their debt obligations.

The central value of national sales was Kshs. 27,523,500 (\$) with a maximum of Kshs. 55,403,000 and a minimum value of 0.0000. This was an indication that the sampled firms made adequate sales from diversified business units spread across the country. The sales volume indicated that the firms were sustaining their competitive advantage by leveraging on their product lines and services within the country.

Table 1: Descriptive Statistics

Variable	Mean	StdDev	Min	Max	C.V
Female	1.1462	1.2458	0.0000	6.0000	1.0870
Tenure Diversity	13.080	10.600	0.0000	48.000	0.8104
Experience	6.3769	3.4219	0.0000	14.000	0.5366
Interlock Directors	5.9077	2.8159	0.0000	12.000	0.4767
Nationality	2.9308	1.6291	1.0000	8.0000	0.5559
Free Cash Flow	0.4909	0.4568	0.0000	4.0789	0.9304
Operating Risk	1.1725	4.7334	-1.5382	37.209	4.0370
Directors Remuneration	79995*	155.448	0.0000	1231.829**	1.3093
Size	15.461	1.4924	12.061	18.497	0.0965
Leverage	4.2576	37.563	0.0006	428.60	8.8227
National Sales	2752.35***	3851.21***	0.0000	5540.30***	1.3992
National Assets	1362.13***	2380.46***	0.0000	3547.94***	1.7461

(***)The figures are in Kshs. ('000000') (**) The figures are Kshs. ('00000')

(*)The figures are Kshs ('000')

Table 2: Variable Description

Variables	Proxy	Expected relation
Dependent Variable		
Diversification:		
National Sales: Segment sales within the country		high/low
National Assets: Investments in segment assets within Kenya		high/low
Independent Variables		
Board characteristics		
Gender diversity: Number of female board members		(+/-)
Tenure diversity: Max duration-Min duration		(+/-)
Experience diversity: Members with international orientation		(+/-)
Nationality diversity: No. of Countries on the board		(+/-)
Interlock directorship: Cross Boards Directors'		(+/-)
Directors Remuneration: Annual board of directors Fees		(+/-)
Control variables		
i. Financial based control variables		
Freecf. Free cash flow	current assets /total assets	(+/-)
Fs: Firm size	natural logarithm of sales	(+/-)
Leverage Long term debt	long term debt/ total assets	(+/-)
ii. Corporate governance variable		
OR Operational risks	operating cost/operating income	(+/-)

Correlation Analysis

Pearson (r) correlation coefficient was computed given the nature of the data and the need to test the strength of association that existed among the study variables given that such strength may differ among firms and industries in various circumstances (Wagner *et al.*, 1998). The results are summarised in appendix 2.

The results of correlation indicated that gender diversity had strongest association with national sales with Pearson coefficient of 0.550 implying that a unit increase of female board member cause an increase in National sales by 0.550. Experience had the highest association with interlock directorship (0.749) implying that a board member with international orientation was more likely to appear on the boards of other listed firms that were included. Experience also had a strong positive correlation of 0.706 with the firm size, inferring that experience influenced sales across the sectors involved in the study. The measure of association was highest between interlock directorship and size of the firm (correlation coefficient was 0.729) meaning a unit increase of interlock director on the board cause the firm size to increase by 0.729. Directors' remuneration had positive correlation with national assets at 0.504. Size and national assets registered strongest correlation coefficient of 0.716. This means there was proportionate positive relation between firm size and investment in assets for various businesses spread across the country. On average, a few of the correlation coefficients were above 0.7 inferring that there was lack of serious multicollinearity among the variables used in the modelling. This implies that there is need to have industry policy that guides on the board composition since the various board members characteristics interrelate differently with firm diversification.

Panel Unit Root Tests

The next step of the analysis was testing for unit root and results are presented in table 2. This was done to determine stationarity of the time series variables because regressing non stationary time series gives spurious regression results. At least three unit root tests were performed as recommended by Green (2012).

Table 2. Results of Panel Unit Root Tests

Variable	Fisher		Levin-Lin-Chu		Remarks
	χ^2	P-Value	T-Star V	P – Value	
Gender	9.2666	0.9990	2.7357	0.9969	No Unit Root
Tenure Diversity	4.7523	1.0000	-2.1822	0.0145	Unit Root
Experience	51.4046	0.00021	-4.2287	0.0000	Unit root
Interlock directorship *	33.5071	0.1479	-3.2807	0.0005	Unit Root
Nationality *	24.6496	0.5389	-4.3362	0.0000	Unit root
Free cash flow	177.128	0.0000	-14.816	0.0000	Unit root
Operating risk	123.0548	0.0000	-6.0181	0.0000	Unit root
Directors remuneration	37.1424	0.0726	-9.0341	0.0000	Unit Root
Size	24.8598	0.5269	0.1118	0.5445	No Unit Root
Leverage	37.3887	0.0689	-9.3923	0.0000	Unit Root
National Sales	17.5908	0.8901	-0.3559	0.3610	No Unit Root
National Assets	13.3816	0.9803	4.2336	1.0000	No Unit Root

The results for panel unit root tests indicated that there was unit root on tenure diversity, experience, interlock directorship, nationality, free cash flows, operating risk, directors' remuneration and leverage. The results also revealed that there was conflicting evidence for unit root between Fisher and Levin-Lin-Chu panel unit root tests for interlock directorship, nationality, directors' remuneration, and leverage. These conflicting results were resolved by use of HadriLagrangian Multiplier test utilizing Swamy-Arora transformation. The results of LM test gave evidence of unit root for all variables (see appendix 1).

Regression Results for National Sales- Static Panels

The study sought to determine the relationship between gender diversity with firm diversification. The results of the regression analysis are presented in table 4. The regression results indicated that R^2 was 0.900427 implying that the variables included in the regression model explained 90% of the variation in the dependent variable. The F-Statistic was also significant (p – value $0.0000 < 0.05$) indicating that all the variables included jointly explained the variation in the dependent variable. The model that best fit the data was selected by the Gaussian principle (Schwarz criterion) in concurrence with Akaike information criterion (AIC) and Hannan-Quinn principle. Spearman rank correlation coefficient indicating a strong association of 0.7645 among the variables included in the regression model. Test of hypothesis revealed board gender diversity had a statistical significant relationship with firm diversification with regard to national sales (p – value $0.0017 < 0.05$). A unit increase of female board member enhanced firm sales by Kshs. 1,487,140 (\$ 14,163). Based on these findings the first research hypothesis was unsupported hence rejected, concluding that board gender diversity was a significant determinant of firm national sales. This finding implied that segments sales may be due to customers' loyalty, distribution network and firm reputation. The presence of female board members provided a unique intangible resource that enhances market confidence given that they are good at relation building and associated with lower agency costs (Bear *et al.*, 2010, Shital and Mishra, 2012).

The study controlled for firm size as an indirect measure of firm's capacity to pursue diversification. The reported results indicated that firm size had positive and significant effect on national sales (p – value $0.0004 < 0.05$), with a beta coefficient showing that national sales increased by Kshs. 2,966,300 (\$28,251) when the size of the firm increased by one unit.

The results from regression equation are expressed in model Y_{it} ('000')

$$\begin{aligned}
 Y_{1it} = & -431759_{it} + 1487.14X_{1it} + 75.573X_{2it} + 243.466X_{3it} - 171.039X_{4it} \\
 & (1.3429) \quad (462.122) \quad (78.849) \quad (223.967) \quad (279.657) \\
 & + 392.937X_{5it} - 157.024X_{6it} + 39.608X_{7it} - 0.00189X_{8it} \\
 & (783.723) \quad (820.18) \quad (66.688) \quad (0.00411) \\
 & + 2966.3X_{9it} - 5.361X_{10it} + \varepsilon_{it} \\
 & (9814.780) \quad (8.521).
 \end{aligned}$$

Table 4. Regression Results for National Sales- Static Panels

Model 1:

Fixed-effects using 130 observations; Included 13 cross-sectional units Time-series length = 10;

Dependent variable: National Sales- Static Panel

Variable	Coefficient	Std. Error	t-ratio	p-value	
Constant	-4.31759e+07	1.22455e+07	-3.5259	0.0006	***
Gender	1.48714e+06	462122	3.2181	0.0017	***
Tenure diversity	75573.3	78849.2	0.9585	0.3400	
Experience diversity	243466	223967	1.0871	0.2795	
Interlock diversity	-171039	279657	-0.6116	0.5421	
Nationality diversity	392937	783723	0.5014	0.6171	
Free	-157024	820180	-0.1915	0.8485	
Operation risk	39607.9	66687.5	0.5939	0.5538	
Remuneration	-1.88733	4.1135	-0.4588	0.6473	
Size	2.9633e+06	814780	3.6369	0.0004	***
Leverage	-5361.09	8521.3	-0.6291	0.5306	

Mean dependent variance	6822391	S.D. dependent variance	9546182
Sum squared residual	1.17e+15	S.E. of regression	3307533
LSDV R-squared	0.900427	Within R-squared	0.362148
LSDV F(22, 107)	43.98114	P-value(F)	1.25e-43
Log-likelihood	-2123.329	Akaike criterion	4292.658
Schwarz criterion	4358.611	Hannan-Quinn	4319.457
Rho	0.764465	Durbin-Watson	0.354042

Joint test on named regressors - Test statistic: $F(10, 107) = 6.07505$ with $p\text{-value} = P(F(10, 107) > 6.07505) = 2.87117e-007$; Test for differing group intercepts - Null hypothesis: The groups have a common intercept Test statistic: $F(12, 107) = 26.0215$ with $p\text{-value} = P(F(12, 107) > 26.0215) = 2.10658e-026$; Distribution free Wald test for heteroscedasticity: $\text{Chi-square}(13) = 2416.57$, with $p\text{-value} = 0.0000$; Pooled error variance = $9.00427e+012$

(***) Significant at 1% (**) Significant at 5%.

The values in the parentheses are standard errors.

The study also sought to establish the relationship between board demographics and firm diversification with regard to segments investment within the country. The results are summarised in table 5. Random effects and fixed effects models were estimated. Hausman test indicated that random effect GLS was suitable. The χ^2 -Statistic was significant (p – value 0.0000 < 0.05) indicating that all the variables included jointly explained the variation in the dependent variable. Results showed that gender diversity had positive and significant effect on national assets (p – value 0.0350 < 0.05), an additional female board member caused the firm investment in assets across the country to increase by Kshs. 2,301,820 (about U\$ 21,922). Regression results indicated that board experience diversity had a significant and positive effect on the firms' diversification in terms national assets within Kenya (p – value 0.0171). The effect of nationality on national assets was negative and significant (p – value 0.0261 < 0.05). These findings reveal that an introduction of an additional single foreign board member reduces the firm's propensity to diversify assets within the country by Kshs 2,555,680 (\$24,339.81).

It was therefore inferred that foreign board member fail to understand business culture, environment and people across the country (Hassan, *et al.*, (2006; Pelled and Xin, 1999). Firm size was found to have appositive and significant influence on firms' investments in diversified assets within the country. The interaction effect of gender, experience, and nationality diversities were associated with lower agency and together with firm size provided dynamic resources mix with significant impact on firm segments assets within Kenya. This finding contrasted the results of Sambharya (1996) but agreed with the view of Hillman *et al* (2002).

Table 5. Regression Results for National Assets-Static Panel

Model 2:

Random-effects (GLS), using 130 observations; Included 13 cross-sectional units

Time-series length = 10; Dependent variable: National Assets

<i>Variable</i>	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
Const	-1.1431e+08	2.06312e+07	-5.5406	<0.0001	***
Gender	2.30182e+06	1.07929e+06	2.1327	0.0350	**
Tenure diversity	94968.6	147388	0.6443	0.5206	
Experience	1.36892e+06	228.4149	2.4178	0.0171	**
Interlock Director	-968622	712865	-1.3588	0.1768	
Nationality	-2.55568e+06	1.13446e+06	-2.2528	0.0261	**
Free Cash Flow	-2.83558e+06	2.24311e+06	-1.2641	0.2087	
Operating Risk	279994	199919	1.4005	0.1640	
Directors Fees	12.6305	11.5199	1.0964	0.2751	
Size	8.24163e+06	1.47434e+06	5.5900	<0.0001	***
Leverage	-9036.12	25143.2	-0.3594	0.7199	

Mean dependent variance	12421010	S.D. dependent variance	21706866
Sum squared residual	2.42e+16	S.E. of regression	14195227
Log-likelihood	-2320.153	Akaike criterion	4662.307
Schwarz criterion	4693.850	Hannan-Quinn	4675.124

Table 5...

Test Statistics

'Within' variance = 7.48344e+013; 'Between' variance = 3.60749e+013; theta used for quasi-demeaning = 0.544543; Breusch-Pagan test - Null hypothesis: Variance of the unit-specific error = 0; Asymptotic test statistic: Chi-square (1) = 87.3686; with p-value = 9.00679e-021

Hausman test - Null hypothesis: GLS estimates are consistent Asymptotic test statistic: Chi-square (10) = 60.8993 with p-value = 2.44835e-009: (***) Significant at 1% (**) Significant at 5%

This result therefore upheld Agency, Resource Based View and Upper Echelon theories of the firm. This analysis led to rejection of: H_{01} , H_{02} and H_{04} , with regard to asset diversification within the country. These findings were expressed as model Y_{2it} ('000).

$$\begin{aligned}
 Y_{5it} = & -114310_{it} + 23018X_{1it} + 94.9686X_{2it} + 1368.92X_{3it} - 968.622X_{4it} \\
 & (2.2623) \quad (0.43540) \quad (147.388) \quad (566.194) \quad (712.865) \\
 & - 2555.68X_{5it} - 2835.58X_{6it} + 279.994X_{7it} + 0.0126X_{8it} \\
 & (0.4567) \quad (0.9049) \quad (199.919) \quad (0.01152) \\
 & + 8241.63X_{9it} - 9.0361X_{10it} + \varepsilon_{it} \\
 & (0.5948) \quad (25.143)
 \end{aligned}$$

NB: Currency translation is on the basis of direct quote \$1=Kshs.105

CONCLUSION

The major objective of the study was to determine the relationship between board characteristics and firm diversification in firms listed on Nairobi Securities Exchange, Kenya. To realize this objective, panel data for ten years 13 thirteen listed firms' was analysed. The interaction effect of six observable characteristics of board and four controlled variables were regressed against dependent variable – diversification which was proxied from two perspectives of the firm (proportion of the consolidated sales generated by the various business segments and products and proportion of consolidated assets traceable to business segments within the country). Previous studies on board diversity and firm diversification have been inconclusive and contrasting for emerging economies (Stephene et al., 2010; Lamont and Polk 2001). However, this study reveals that the more diverse the board is, the firm diversification is affected

differently nationally. The study revealed that board gender diversity has a positive and significant relationship with firm diversification (p – value $0.0017 < 0.05$). This was confirmed by positive and significant coefficient with national sales. It was noted that firm size positively influenced this relationship with (p – value $0.0004 < 0.05$).

Regarding investments in segments assets nationally, the study revealed that gender diversity had positive and significant effect on national assets (p – value $0.0350 < 0.05$), Regression results indicated that board experience diversity had a significant and positive effect on the firms' diversification in terms assets within Kenya (p – value 0.0171). The effect of nationality on national assets was negative and significant (p – value $0.0261 < 0.05$). The quantitative analysis results utilizing FGLS – static panel analysis showed that the independent variables for the research differently influenced financial diversification of the listed firms on the two proxy measures: national sales, national assets. Based on the findings, it was concluded that no single board characteristic selected for the research could be viewed as having a stand-alone significant effect on firm diversification.

CONTRIBUTION TO THEORY

The results provide support for the RBV, Upper echelon theory, Agency theory, and free cash flow hypothesis on firm financial diversification within and outside the country. The board of directors provide a set of skills, expertise and knowledge that together with firm resources creates synergy and competitive advantage for the investment within and outside the country. The attitude of the board of directors towards risk as they increase the scope of the firm nationally based on their observable characteristics' and cognitive skills validated the use of Upper Echelon Theory. Operational risk predominantly used in financial institutions was used to proxy risk in commercial and manufacturing sectors evident by the interaction effect with study variables. This study is a behavioural compliment contribution to the more convectional financial dimensions of firm performance particularly ROE, ROI and EPS.

IMPLICATION TO PRACTICE

The study established that different board characteristics have different outcomes. This findings mirror the results of Pelled *et al.*, (1999), Hassan, *et al.*, (2006) and Bear *et al.*, 2010) but differ on the basis of parameters used in model fitting on firm diversification. The interaction effect of gender, experience and nationality diversities together with firm size are found to be significant determinants of diversification across the country. Tenure, interlock directorship and directors fees diversities were found to have insignificant effect to diversification within the country.

Given that majority boards are male dominated, it is recommended that Capital market Authority and Company registrar in Kenya should formulate a policy requiring that a 30% gender rule with regard to board composition of listed firms. This should be done both in short and long run as part of the system-wide adjustments to develop women executives for listed firms in Kenya.

The players in the capital market and various productive sectors of economy should encourage firms' to incorporate more board members of different nationalities and international experience for they have a better insight of investments and political environments on a global perspective which they may share to improve local corporations.

LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

The first study limitation was in relationship to the sample selected that was restricted to Commercial services and Manufacturing sectors that could not provide explicit generalizability of the results to other sectors of the economy since the boards of such companies may have had a higher likelihood to diversify within and outside the country. The firms selected were largest in terms of assets and sales as well as having been noted to be key drivers of the Kenyan Economy (KNBS, 2008, 2009, 2012, 2013). Secondly, the study did not account directly for external factors particularly inflation, foreign exchange rates and borrowing rates that affect the firm's access to debt finance to fund diversification strategies, instead it proxied for their effect through operational risk. These factors together with regional economic treaties (East Africa Community Treaty, COMESA among others) may interplay with board demographics to yield different results for the firm business segments outcomes the country. Lastly a wider mapping of board composition with regard to independent directors, executive and none-executive directors could be examined in relationship to firm diversification by drawing samples across East Arica Stock Exchanges either for intra or ex-intra industry ties.

The board characteristics may inform firm performance indicators in other industries that may be susceptible to dramatic sector specific changes that necessitate the firm to rethink their business diversification model to guarantee their long term survival and viability. Thus future research may be conducted to interrogate further the relationship between board characteristics and sector specific changes (regulation- regional economic treaties) and firm propensity to diversify regionally. Similarly, further research may be conducted to examine the relationships between board characteristics, macro-economic factors (inflation, foreign exchange rates and borrowing rates) and firm level of diversification. Lastly a wider mapping of board composition with regard to independent directors, executive and none-executive directors could be examined in relationship to firm diversification by drawing samples across East Arica Stock Exchanges either for intra or ex-intra industry ties.

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APPENDICES

Appendix 1: Results of HadriLagrangian Multiplier Panel Data Unit Root Test, Swamy- Arora Transformation

Variable	Homogeneity		Heterogeneity		Serial Dependence		Remarks
	Z(Mu) ⁽¹⁾	P – Value	Z(Mu) ⁽²⁾	P – Value	Z(Mu) ⁽³⁾	P – Value	
Gender	13.128	0.0000	0.0000	0.0000	5.488	0.0000	Unit Root
Tenure diversity	11.981	0.000	24.250	0.0000	5.786	0.000	Unit Root
Experience	2.039	0.0207	11-774	0.0000	5.306	0.0000	Unit Root
Interlock directorship	4.690	0.0000	3.786	0.0001	5.654	0.0000	Unit Root
Nationality	3.691	0.0000	34.377	0.0000	5.826	0.0000	Unit Root
Free cash flow	-0.033	0.5132	4.246	0.0000	5.717	0.0000	Unit Root
Operating risk	-1.914	0.9722	-0.066	0.5264	0.5494	0.0000	Unit Root
Directors remuneration	-0.951	0.8293	5.178	0.0000	5.610	0.0000	Unit Root
Size	10.265	0.0000	12.344	0.0000	5.818	0.0000	Unit Root
Leverage	-1.493	0.9323	3.925	0.0000	5.533	0.0000	Unit Root
National sales	16.730	0.0000	10.740	0.0000	5.844	0.0000	Unit Root
National assets	8.299	0.0000	9.508	0.0000	6.032	0.0000	Unit Root

Appendix 2: Correlation Analysis

Variable	Female	Tenure	Experience	Directorship	Nationality	Cash Flows	Risk	Fees	Size	Leverage	NSales	NAssets
Gender	1.0000											
Tenure	0.1584	1.0000										
Experience	0.3343	-0.0155	1.0000									
Directorship	0.1784	-0.0237	0.7486	1.0000								
Nationality	0.2075	0.1384	0.2606	0.4126	1.0000							
Cash Flow	0.0587	-0.1980	0.0189	0.1094	0.1056	1.0000						
Risk	-0.0726	-0.0621	0.0955	0.1625	-0.0711	0.0087	1.0000					
Fees	0.2430	0.0968	0.3664	0.2622	0.2196	-0.0377	0.0156	1.0000				
Firm Size	0.3179	0.0383	0.7063	0.7292	0.2607	0.1133	0.1727	0.4910	1.0000			
Leverage	0.1331	0.0954	0.0232	0.1309	0.2195	-0.0674	-0.0104	0.0157	0.0542	1.0000		
NSales	0.5496	0.1130	0.5398	0.2911	0.2930	0.0520	0.0060	0.4739	0.5772	0.0199	1.0000	
NAssets	0.2276	0.1162	0.5443	0.4310	-0.0282	-0.1122	0.2260	0.5036	0.7162	-0.0105	0.4245	1.0000