

Impact of firm specific and macroeconomic factors on financial performance of UAE Insurance sector

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Abstract

This study analyzes the impact of firm specific and macroeconomic factors on the profitability of the insurance sector in UAE during the period 2009- 2013. In the recent past the global insurance sector was impacted by the ripple effect of the financial crisis of 2007-2008. Along the lines of the global trend, although profitability of the UAE insurance sector witnessed a decline from 2008-10, the spur in its growth rates (10%) in 2012 and 2013 is impressive compared to the negative growth rate in developed markets. Our research contributes to the existing body of knowledge on financial performance of insurance sector post the global financial crisis. Our results indicate that within the firm specific factors; company size, growth in gross written premium (GWP), leverage, investment ratio and market share are statistically significant in explaining profitability of the insurance companies. Further, GDP growth has a significant positive influence on profitability.

1. INTRODUCTION

The insurance industry has an essential role in fostering economic growth of a country particularly because it gives fillip to the other sectors of the economy such as health, motor, infrastructure, banking and capital markets. Empirical studies have highlighted positive correlation between insurance development and economic growth (Enz, 2000; Arena, 2006). Hence studies analysing the performance of insurance sector have received considerable attention from researchers in both developed as well as the emerging economies (Adams and Buckle, 2003; Ahmed et al., 2011; Charumathi, 2012; Kozak, 2011; Mehari and Amerio, 2013; Pervan and Pavić, 2010; Shiu, 2004). In the Middle East, studies relating to the insurance sector are relatively scarce (Almajali et al., 2012; Derbali, 2014; Miniaoui and Chaibi, 2014; Najjar, 2012).

Macroeconomic factors such as the GDP growth, population and interest rates influence the expansion and profitability of the insurance sector. These and other macro-economic variables have been found to have a significant impact on the insurance growth of an economy (Beenstock

et al., 1988; Browne and Kim, 1993; Fortune, 1973; Headen and Lee, 1974; Outreville, 1990; Ward and Zurbrugg, 2002).

In the recent past the global insurance sector was impacted by the ripple effect of the financial crisis of 2007–2008, such as the fall in the global equity markets, decline in the interest rates and economic slowdown. Although insurance industry in the GCC has experienced steady growth in the last decade, prolonged global uncertainty has posed substantial challenges to it by creating volatility in investment values and returns. However, the combined gross written premium (GWP) in the region has grown at a CAGR of 11.8% since 2008 to 2012 (Swiss Re, 2010) fuelled by GDP growth, compulsory health insurance in some jurisdictions and increase in population. UAE is the largest insurance market in the GCC with over \$7.2 billion (Dh26.4 billion) insurance revenues in 2013, which is approximately 45% of the premiums written in the GCC (Moody's Investor service). Further, UAE's insurance industry grew at an annual average rate of 9.6% between 2008–2012 and by 10% in 2013 (Insurance Authority, UAE).

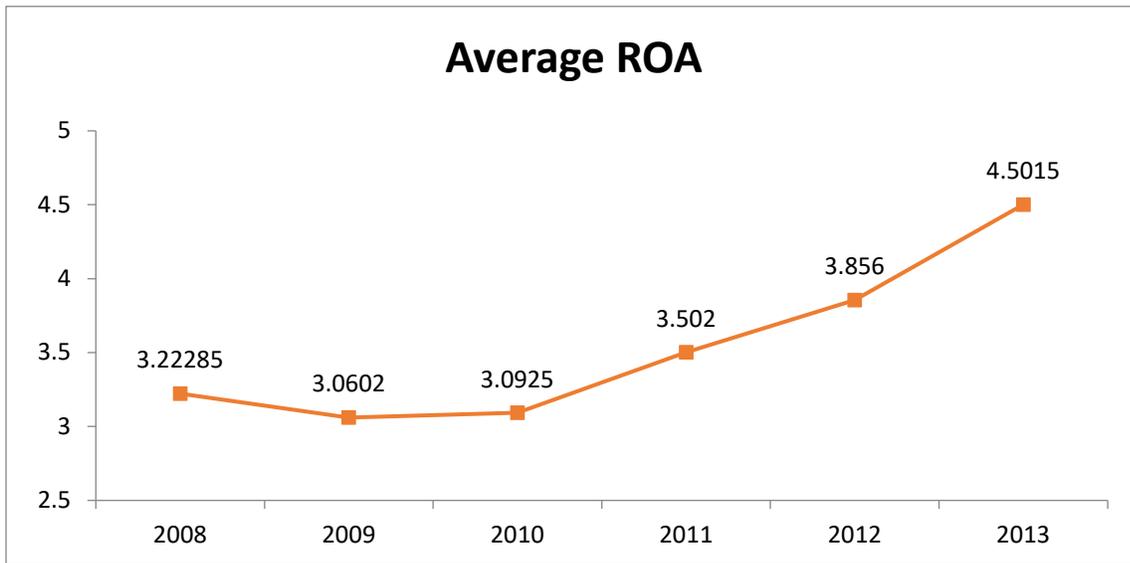
Insurance penetration in UAE in 2013 was 2% of its GDP which is higher than most of the GCC countries but it is far below US and UK which is 8% and 11% respectively.

Performance of the insurance sector is also influenced by a range of internal factors. There have been studies where factors such as company size, age, underwriting risk, solvency margin and leverage were found to have a significant impact on company profitability (Batra, 1999; Ćurak et al., 2011; Ismail, 2013; Majumdar, 1997; Malik, 2011; Shiu, 2004;). However there are few studies that have analysed the financial performance of the UAE insurance sector after the financial crisis in 2007–2008. Further to the author's knowledge no studies have explored the impact of both internal and macroeconomic factors on profitability of insurers.

Along the lines of the global trend, although profitability of the UAE insurance sector witnessed a decline from 2008–2010 (Figure 1) it is interesting to note that the spur in growth rates achieved in 2012 and 2013 is impressive compared to the negative growth rates in two big markets namely Japan (–7%) and US (–6%). Despite the healthy growth rate, IMF and multiple rating agencies have considered UAE's insurance industry overcrowded which has an unfavourable impact on the market's overall performance. In 2013 insurance authority has proposed a slew of regulations for consolidation and further strengthening of the sector.

In the light of above discussion, it may be noted that 2009–2013 has been an interesting period with a series of developments in the UAE insurance sector with reference to its financial performance and the macroeconomic environment in the country. Hence, it is imperative to analyse the factors which have influenced the profitability of the insurance sector in UAE during this period.

Fig 1: Average ROA from 2008-2013



2. OBJECTIVE

The purpose of this paper is to determine the macroeconomic and firm specific factors which impact the profitability of the UAE insurance sector from 2009- 2013. The macroeconomic factors selected for the study are GDP per capita, inflation and stock market general index. Internal factors include, size, growth in gross written premium, market share, leverage, solvency margin, investment ratio, risk retention ratio and loss ratio. Financial performance is proxied by ROA (return on assets).

The rest of the paper is structured as follows. The following section presents literature review of related studies. The research methodology is described in section 3 and section 4 discusses the data analysis and findings. Our conclusions are presented in the section 5 and the last section summarizes the limitations of this study and future research.

3. LITERATURE REVIEW

There is a vast literature available on the determinants of financial performance of the insurance sector in the US, UK and other developed economies. Some of the earliest studies on the determinants of profitability of the insurance sector in the US was conducted by Wright (1992) on the economic and regulatory issues of the life insurance companies where he argued that actual mortality experience, investment earning, capital gains and losses, the scale of policyholder's dividends and federal and state taxes affects the economic performance of insurance companies. Thereafter, studies conducted on the relationship between profitability and market structure, authors found a significant positive impact of concentration on profitability (Bajtelsmit and Bouzouita, 1998; Chidambaran et al., 1997; Choi and Weiss, 2005; Cole et al., 2015; Dafny et al., 2010). However most of them were unable to provide evidence on whether this positive relationship was due to collusion among the insurers or efficient operations.

Studies relating to impact of firm-specific factors on the financial performance of insurance sector in the developed economies include analysis of Bermuda insurance and reinsurance companies during the period 1993–1997 where leverage and company type were found to be positively related to company performance while risk and liquidity were negatively related (Adams and Buckle, 2003). Further, authors that examined the impact of firm specific, industry specific and macroeconomic variables on the Croatian insurance market performance found that the significant factors included ownership, expense ratio, inflation, underwriting risk, size and equity returns (Ćurak et al., 2011; Pervan and Pavić, 2010).

In a study on the general insurance sector in Poland during 2002–2009 using the regression model, the results showed that reduction in motor insurance with simultaneous increase of other types of insurance, growth in gross premium, operating cost reduction, GDP growth and market share growth for foreign companies has a positive impact on profitability and cost efficiency whereas offering too broad spectrum of classes of insurance has a negative impact (Kozak, 2011). Burca and Batrinca (2014) used fixed and random effects model in their study and showed evidence of significant impact of growth in gross premium along with other factors viz. leverage, size, underwriting risk, risk retention ratio and solvency margin on the financial performance of the Romanian insurance market.

In the context of emerging markets, Charumathi (2012) studied the impact of six independent variables on the financial performance of the Indian life insurers and concluded that size and liquidity have significant and positive influence while leverage, growth of GWP and volume of equity have a negative and significant influence. Similar results were shown with respect to size and leverage in a study on the Pakistan insurance market which also found that volume of capital and loss ratio had a significant impact on the financial performance (Malik, 2011).

Contradictory to the above results, in a study of Ethiopian insurance sector performance by Mehari and Aemiro (2013) GWP and liquidity were found to be insignificant while size, loss ratio, tangibility and leverage were shown as significant factors. Ismail (2013) conducted a study on the general Islamic and conventional insurance companies in Malaysia where investment yield is used as the measure of financial performance. Using three models of panel data estimation the author found that size, retakaful/reinsurance dependence and solvency margin are statistically significant with the general Islamic insurance companies. The above mentioned factors along with interest rate levels, liquidity and premium growth were significant for the financial performance of conventional insurance companies.

The Middle East insurance market has been getting attention from researchers in more recent times in the event of the regulatory and structural changes in these economies. Almajali et al. (2012) analysed the insurance companies listed on the Amman Stock Exchange during 2002–2007 using multiple regressions and found that liquidity, leverage, company size and management competence index have a statistical positive effect on insurers. A study on determinants of financial performance of the Tunisian life insurance companies concluded that height, age and premium growth are significant for performance measured by ROA whereas leverage, tangibility, liquidity and risk have no significant impact (Derbali, 2014). In a study analysing the impact of corporate governance mechanisms on financial performance of Bahrain insurance firms, Najjar (2012) observed that board size, firm size and number of block-holders have a significant impact on firm performance expressed by return on equity (ROE).

In UAE, Rao et al. (2010) analysed efficiency and productive issues of insurance sector during the period 2000–2004 by using ‘administrative and general expenses’ and ‘equity and change in legal reserves’ as inputs. Applying DEA model, the authors found considerable degree of managerial inefficiency among the insurers.

4. RESEARCH METHODOLOGY

Our research contributes to the existing body of knowledge on financial performance of insurance sector post the global financial crisis, by exploring the impact of firm specific and macroeconomic factors on the UAE insurance sector which has not yet been studied. The research questions addressed in this paper are:

- Which are the firm specific variables that impact financial performance of the insurance sector
- Whether the macroeconomic variables effect financial performance of the insurance sector during the period 2009-2013
- What was the overall impact of the firm specific and macroeconomic variables on the profitability of the insurance sector in UAE during the selected period?

4.1 Sample

This study attempts to analyse the determinants of the financial performance of the insurance market in the United Arab Emirates. The research was based on secondary data obtained from the audited annual report of 20 insurance companies in the United Arab Emirates that are listed on the two stock exchanges, namely the Abu Dhabi Securities Market and the Dubai Financial Market. 11 companies were listed in Abu Dhabi and nine were listed in Dubai.

Since we considered a balanced panel data, 20 companies were selected for the study out of the total listed companies. Consequently, companies listed after 2008 were not included in the study. Secondary data was obtained from annual reports of each individual company for each financial year, the Arab Stock Market Analysis database, and various press releases by each insurance company. The data for macroeconomic indicators was accessed from the International Monetary Fund and the World Bank websites.

These variables are described and defined in Table 1. Financial performance of insurers has been proxied by the dependent variable ROA. Although researchers in the past have considered various measures for company financial performance for their study such as ROA, ROE [return on sales, economic value added (EVA)] but ROA has been most widely used financial performance indicator in studies on insurance (Agiomirgiannakis et al., 2006; Ahmed et al., 2011; Burca and Batrinca, 2014; Chen et al., 2009; Ćurak et al., 2011; Liebenberg and Sommer, 2008). ROA is an indicator of the efficiency with which a firm uses its total assets measuring net profit generated for each dirham of net assets.

The firm specific and macroeconomic variables used in this study are selected based on the relevant theory and literature. Size, growth in GWP, market share, leverage, solvency margin, investment ratio, risk retention ratio and loss ratio are the firm specific variables that have been in a vast number of studies on determinants of a financial performance of insurers (Almajali et al., 2012; Charumathi, 2012; Derbali, 2014; Mehari and Aemiro, 2013).

GDP per capita is one of the macroeconomic factors included in this study and needs a special mention here. There are some studies which have included real GDP growth while a few other studies have considered the GDP per capita. Beck and Webb (2002) argued that countries with large GDP per capita have high life insurance consumption (Sen and Madheswaran, 2007). In another study by Bhatia and Jain (2013) GDP per capita was found to be highly correlated with insurance penetration, density and absolute amount of premium. In yet another study on the determinants of financial performance of insurers, the authors have included gross national income (GNI) per capita as one of the macroeconomic variables (Doumpos et al., 2012).

4.2 Model specification

As explained earlier, this study included the data from 2009 to 2013 since the objective was to study the performance indicators for the insurance companies during the recession years (2009-2010) and to investigate the factors that played an important role during the recovery period (2011-2013). The data was analyzed using Econometric Views (EViews) software. In the estimation procedure, we use the Robust Least Squares iterative re-weighted method using Huber's M-estimator.

Table 1: Description of company-specific and macroeconomic variables

Variable	Definition
ROA	Return on Total assets ratio
SIZE	Log of Total assets
LEVERAGE	Net technical reserve/Equity
GWP_GR	Growth in Gross written premium
INV_RATIO	Investments/Total Assets
MKT_SHARE	GWP/Total GWP for all companies
LOSS_RATIO	Gross claims/GWP
RETRISK_RATIO	Net written premium/GWP
PC_GDP	Per capita GDP
INFLATION	Inflation rate
INVT_GDP	Investment-GDP ratio
SECURITY	Log UAE general index
EIBOR	Emirates Interbank Offered Rate

5. FINDINGS AND DISCUSSION

5.1 Descriptive Statistics

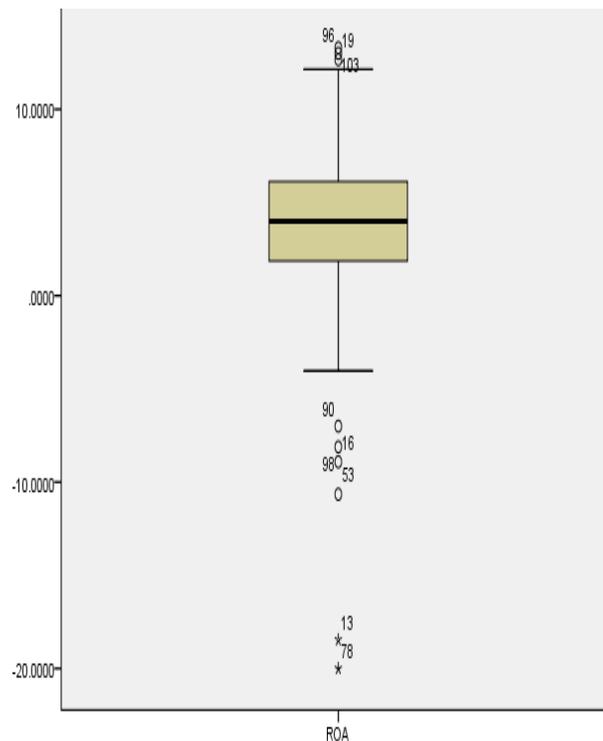
The assumption of normality needs to be checked before performing any statistical procedures, namely parametric tests, because their validity depends on it. As it can be seen from Table 2, almost all the variables are asymmetrical and the kurtosis value of almost all variables shows that our data is not normally distributed (values of kurtosis are deviated from 3). Based on the calculated Jarque-Bera statistics and the corresponding p-values, the null hypothesis of normality is rejected by our data.

Once the normality assumption was rejected, the next step was to investigate if the non-normality was due to presence of outliers. The choice of the estimation technique would depend on the nature of the dependent variable – in our case, the Return on Assets (ROA). The box-plot of the ROA in Figure 2 supported our hypothesis of the presence of outliers.

Table 2: Descriptive statistics of the company-specific variables

	Mean	Median	Std. Dev.	Skewness	Kurtosis		Jarque-Bera	Probability
ROA	3.5391	3.995	4.8242	-2.0694	10.6974		381.9112	0.0000
SIZE	9.008	8.977	0.362	0.352	2.0225		7.256896	0.0265
LEVERAGE	38.939	28.008	32.1267	1.8865	6.9959		151.0182	0.0000
GWP_GR	0.0661	0.054	0.1914	0.0397	4.0217		5.251453	0.0724
INVT_RATIO	0.4173	0.401	0.2098	0.1388	2.2840		2.947919	0.2290
MKT_SHARE	4.878	2.888	5.1786	1.6881	4.7653		72.57718	0.0000
RETRISK_RATIO	0.534	0.518	0.230	2.394	11.0083		435.3214	0.0000
LOSS RATIO	0.579	0.535	0.246	1.612	9.8790		288.6140	0.0000

Figure 2: Box Plot of Return on Assets (ROA)



5.2 Estimation

In the presence of outliers, one solution is to screen the data, remove outliers and then apply classical inferential procedures. However, rejection of outliers in the analysis implies that the value of the arithmetic mean changes since the mean is shifted in the positive direction of the outlier. Therefore, it is always better to down-weight outliers rather than reject them from the dataset unless they can be categorized as being completely wrong observations. Moreover, rejecting outliers reduces the sample size, could affect the distribution, and variances could be underestimated from the cleaned data.

Empirical evidence shows that good robust procedures give very reliable estimates by providing stable results in the presence of outliers. “Robust least squares” (RLS) refer to a variety of regression methods designed to be less sensitive to outliers. The most commonly used method today is the M-estimation under the RLS technique which was introduced by Huber (1973) that substantially improves the Ordinary Least Squares results. Instead of minimizing a sum of squares, a Huber-type M-estimator minimizes a sum of less rapidly increasing functions of the residuals by using iteratively re-weighted least squares (IRLS).

The ordinary least squares estimator (OLS) is computed by finding coefficient values that minimize the sum of the squared residuals:

$$\hat{\beta} = \min \sum_{i=1}^N r_i(\beta)^2$$

where r is the residual function. Since the residuals r_i are getting squared, the effects of outliers are magnified as well. So, in the presence of outliers, we use the M-estimator which introduces a function that provides less weight to outliers so that

$$\widehat{\beta}_M = \min \sum_{i=1}^N \rho \left(\frac{r_i(\beta)}{\sigma w_i} \right)$$

where σ is a measure of the scale of the residuals and w_i are individual weights that are generally set to 1 for OLS, but are set to:

$$w_i = \sqrt{1 - X_i(X'X)^{-1}X'_i}$$

So that the observations of the dependent variable with the large outliers get down-weighted. The estimate is calculated using a sequential procedure which calculates the “ σ ” at each stage and uses it to recalculate the “ β ”, until a convergence is reached. This iterated reweighted least-squares method.

Another point to be noted is that the coefficient of determination gets updated as well since both the R^2 and the adjusted R^2 can be highly sensitive and upwardly biased depending on the estimation technique. Renaud and Victoria-Feser (2010) proposed the Rw^2 statistic to be a better measure of fit than the robust outlined above.

5.3 Estimation Results

Our results clearly indicate that within the firm specific factors; company size, growth in gross written premium (GWP), leverage, investment ratio and market share are statistically significant in explaining profitability of the insurance companies.

Leverage has a negative impact on profitability of insurers in UAE which is consistent with most of the previous studies (Adams & Buckle, 2000; Browne et al., 2001; Malik, 2011). This result indicates that a further increase in leverage will have an adverse effect on profitability. A high ratio of technical reserves to equity implies that the equity cushion available is inadequate to support any increase in potential liabilities that exceeds its reserves and may lead to insolvency. The importance of technical reserve was highlighted by Kannau (2007) stating that a low solvency margin may be sufficient if the reserving policy is very prudent whereas a higher solvency margin may be inadequate if the technical provisions are low.

Evidently GWP growth has a positive impact on profitability which is significant at 1%. Similar results were found by Moro and Anderloni (2014), Burca and Batrinca (2014), Kaya (2015) and Kozak (2011)). Further, in this regard Leflaive (2001) opines that a company’s growth entails special risk if it is excessively or poorly coordinated and if risk selection and pricing is not done with necessary care. The positive influence of premium growth has been contributed by increase in underwriting activity in UAE. This finding implies a well-coordinated growth and proper

pricing by the UAE insurers. Profitability is also significantly influenced by market share. This result is consistent with Gale's (1972) argument that high market share might result in high profit, mainly because high market share boosts a firm's market advantage and its ability to set prices, which helps the firm to boost profit and achieve economies of scale. In the case of UAE insurance firms, increase in premium growth led to the increase in market share.

Dependent Variable: ROA
 Method: Robust Least Squares
 Included observations: 120
 Method: M-estimation
 Huber Type I Standard Errors & Covariance

Variable	Coefficient	Std. Error	z-Statistic	Prob.
LEV=NTR_EQ	-0.042920	0.008899	-4.823087	0.0000***
SIZE	-4.698974	1.384678	-3.393551	0.0007***
GWP_GR	3.146443	1.554692	2.023837	0.0430**
MKT_SHARE	0.232622	0.103836	2.240280	0.0251**
INVT_RATIO	-3.383086	1.287206	-2.628240	0.0086***
RETRISK_RATIO	-0.432251	1.161625	-0.372109	0.7098
LOSS_RATIO	-1.408963	0.994942	-1.416126	0.1567
PCGDP	0.000457	0.000227	2.009885	0.0444**
INFLATION	-0.184612	0.110099	-1.676781	0.0936*
INVT_GDP	0.201805	0.229392	0.879738	0.3790
SECURITY	-3.030201	7.771156	-0.389929	0.6966
EIBOR	0.835179	0.718688	1.162089	0.2452

Robust Statistics			
R-squared	0.202333	Adjusted R-squared	0.121089
Rw-squared	0.432055	Adjust Rw-squared	0.432055
Akaike info criterion	179.5008	Schwarz criterion	218.3998
Deviance	751.2225	Scale	2.160424
Rn-squared statistic	392.4767	Prob(Rn-squared stat.)	0.000000

Contrary to expectations, our study reveals that firm size has a negative impact on financial performance which is significant at 1%. According to Athanasoglou et al., (2008) the effect of a growing size of a bank on profitability has been proved to be positive to a certain extent. However, for firms that become extremely large, the effect of size could be negative due to bureaucratic and other reasons (LiYuqi, 2007). In a study on Bermuda insurance market, Adam & Buckle (2003) found that size was negatively related with the performance of the insurance companies, but these results were insignificant (see also Almajali et al., 2012; Fenn et al., 2008; and Moro and Anderloni, 2012). This result implies the possibility that big companies have grown beyond the technical optimal level and have high operating expenses. The reinsurance dependency of most of the big firms have gone up since 2009 to protect themselves from insolvency risk. However, this increases costs associated with reinsuring underwriting risk and results in a huge chunk of the

premium being ceded in reinsurance which substantially reduces the net written premium and profits.

Further, profitability is influenced significantly by investment ratio. The negative impact of this ratio may be due to the investment mix of the firms which is skewed towards real-estate and equity. The value of these assets have taken a severe beating due to real estate and stock market crash in the aftermath of the financial crisis.

Within the macro-economic variables, inflation has a negative impact on profitability which is significant at 1%. Most of the past studies have found similar result on the impact of inflation on financial performance (Brown et al. 2001; Curak et al. 2011; Pervan and Pavic, 2010 and Shiu, 2004). It is observed that the decrease in inflation rate during the post-crisis contributed to the rebound in the profitability of the insurance sector. Further, GDP growth has a significant positive influence on profitability. This result is consistent with other studies on the impact of macro-variables on insurance firms' profitability (Ahmed et al. 2011 and Kozak, 2011). It is noteworthy to mention that when the per capita GDP of UAE was negative in 2009, the firm profitability was also declining compared to the pre-crisis level but with a gradual rise in GDP growth rate was there was a recovery in the profitability .

6. CONCLUSIONS AND RECOMMENDATIONS

This study attempts to analyze the determinants of the financial performance of the insurance market in the United Arab Emirates. Both internal and macro-economic variables have been included in the study. The macroeconomic factors selected are GDP per capita, inflation and stock market general index. Internal factors include, size, growth in gross written premium, market share, leverage, solvency margin, investment ratio, and loss ratio. The impact of leverage, size and growth in GWP on the firm profitability is significant. Further, per capita GDP has a positive and significant impact on profitability while the effect of inflation is significant with a negative sign. Risk retention ratio and loss ratio are insignificant in explaining financial performance of UAE insurance sector.

The UAE insurance firms should focus on the above internal factors for improving their financial performance. Volume of assets should not be increased further owing to the adverse impact of size on profitability. Firms need to maintain adequate and appropriate technical reserves according to the nature of their potential liabilities. This necessitates that the assessment should be done by specialists such as an actuary. Further, companies should focus on improving their asset quality by limiting their investment in risky asset classes and include more government securities, cash and deposits in their investment mix.

It is further suggested that the minimum capital requirement of Dhs 100 million may be increased which will encourage the insurers to retain the premium and reduce the reinsurance dependency.

In line with the international best practices, the IA (insurance authority) has issued regulations in February 2015 for standardizing the process of calculating the technical provisions which includes the companies requiring that the assessments be done by actuaries and also set limits for exposure to equity, derivatives and real estate. Once these regulations are implemented across the companies, it will contribute to the robustness of the insurance sector which in turn will enhance the contribution of the sector to the economic growth of the nation.

7. FUTURE RESEARCH

This study is country specific and therefore may be extended to include other GCC countries to analyze the determinants of financial performance across the region. Further research may also include the impact of mergers and acquisition on firm performance as the middle- east market has witnessed several mergers announcements in the recent past.

References:

- Adams, M. and Buckle, M. (2003) 'The determinants of corporate financial performance in the Bermuda insurance market', *Applied Financial Economics*, Vol. 13, No. 2, pp.133–143, Routledge.
- Agiomirgiannakis, G., Voulgaris, F. and Papadogonas, T. (2006) 'Financial factors affecting profitability and employment growth: the case of Greek manufacturing', *International Journal Financial Services Management*, Vol. 1, Nos. 2/3, pp.232–242.
- Ahmed, N., Ahmed, Z. and Usman, A. (2011) 'Determinants of performance: a case of life insurance sector of Pakistan', *International Research Journal of Finance and Economics*, Vol. 61, No. 1, pp.123–128.
- Almajali, A.Y., Alamro, A.S. and Al-Soub, Y.Z. (2012) 'Factors affecting the financial performance of Jordanian insurance companies listed at Amman Stock Exchange', *Journal of Management Research*, Vol. 4, No. 2, pp.266–289.
- Arena, M. (2006) *Does Insurance Market Activity Promote Economic Growth? A Cross-Country Study for Industrialized and Developing Countries*, Working Paper, World WPS4098 Bank [online] <https://openknowledge.worldbank.org/bitstream/handle/10986/9257/wps4098.pdf;sequence=1> (accessed 8 August 2015).
- Athanasoglou, P., Brissimisi, S.N. and Delis, M.D. (2008) 'Bank-specific, industry-specific and macroeconomic determinants of bank profitability', *Journal of International Financial Markets, Institutions and Money*, Vol. 18, No.2, pp.121–136.
- Bajtelsmit, V.L. and Bouzouita, R. (1998) 'Market structure and performance in private passenger automobile insurance', *The Journal of Risk and Insurance*, Vol. 65, No. 3, pp.503–514.
- Beck, T. and Webb, I. (2002) 'Economic, demographic and institutional determinants of life insurance consumption across countries', *The World Bank Economic Review*, Vol. 17, No. 1, pp.55–81.
- Beenstock, M., Dickinson, G. and Khajuria, S. (1988) 'The relationship between property liability insurance premiums and income: an international analysis', *Journal of Risk and Insurance*, Vol. 55, No. 2, pp.259–272.
- Bhatia, B.S. and Jain, A. (2013) 'Relationship of macroeconomic variables and growth of insurance in India: a diagnostic study', *International Journal of Advances in Management and Economics*, Vol. 2, No. 6, pp.50–54.
- Browne, J., Carson, J.M. and Hoyte, R.E. (2001) 'Dynamic financial models of life insurers', *North American Actuarial Journal*, Vol. 5. No. 2, pp.11–26.
- Browne, J., Carson, J.M. and Hoyte, R.E. (2001) 'Dynamic financial models of life insurers', *North American Actuarial Journal*, Vol. 5. No. 2, pp.11–26.
- Browne, M.J. and Kim, K. (1993) 'International analysis of life insurance demand', *The Journal of Risk and Insurance*, Vol. 60, No. 4, pp.616–634.
- Burca, A. and Batrinca, G. (2014) 'The determinants of financial performance in the Romanian insurance market', *International Journal of Academic Research in Accounting, Finance and Management Sciences*, Vol. 4, No. 1, pp.299–308.
- Charumathi, B. (2012) 'On the determinants of profitability of Indian life insurers – an empirical study', *Proceedings of the World Congress on Engineering WCE 2012*, London, UK, Vol. 1 [online] http://www.iaeng.org/publication/WCE2012/WCE2012_pp505-510.pdf (accessed 25 July 2015).
- Chen, J.S., Chen, M.C., Liao, W.J. and Chen, T.H. (2009) 'Influence of capital structure and operational risk on profitability of life insurance industry in Taiwan', *Journal of Modelling in Management*, Vol. 4, No. 1, pp.7–18.
- Chidambaran, N.K., Pugel, T.A. and Saunders, A. (1997) 'An investigation of the performance of the US property-liability insurance industry', *The Journal of Risk and Insurance*, Vol. 64, No. 2, pp.371–381.
- Choi, B.P and Weiss, M.A. (2005) 'An empirical investigation of market structure, efficiency, and performance in property-liability insurance', *Journal of Risk and Insurance*, Vol. 72, No. 4, pp.635–673.

- Cole, C., He, E. and Karl, J.B. (2015) 'Market structure and the profitability of the US health insurance marketplace: a state-level analysis', *Journal of Insurance Regulation*, Vol. 34, No. 4, pp.1–30 [online] http://www.naic.org/documents/prod_serv_jir_JIR-ZA-34-04-EL.pdf (accessed 20 September 2015).
- Ćurak, M., Pepur, S. and Poposki, K. (2011) 'Firm and economic factors and performance: Croatian composite insurers', *The Business Review Cambridge*, Vol. 19, No. 1, pp.136–142.
- Dafny, B. (2010) 'Are health insurance markets competitive?', *American Economic Review*, Vol. 100, No. 4, pp.1399–1431.
- Derbali, A. (2014) 'Determinants of performance of insurance companies in Tunisia: the case of life insurance', *International Journal of Innovation and Applied Studies*, Vol. 6, No.1, pp.90–96.
- Doumpos, M., Gaganis, C. and Pasiouras, F. (2012) 'Estimating and explaining the financial performance of property and casualty insurers: a two-stage analysis', *JCC: The Business and Economics Research Journal*, Vol. 5, No. 1, pp.155–170.
- Enz, R. (2000) 'The s-curve relation between per-capita income and insurance penetration', *The Geneva Papers on Risk and Insurance-Issues and Practice*, Vol. 25, No. 3, pp.396–406 [online] <http://www.oecd.org/pensions/insurance/45044788.pdf> (accessed 10 July 2015).
- Fenn, P., Vencappa, D., Diacon, S., Klumpes, P. and O'Brien, C. (2008) 'Market structure and the efficiency of European insurance companies: a stochastic frontier analysis', *Journal of Banking and Finance*, Vol. 32, No. 1, pp.86–100.
- Fortune, P. (1973) 'A theory of optimal life insurance: development and tests', *Journal of Finance*, Vol. 28, No. 3, pp.587–600.
- Gale, B. (1972) 'Market share and rate of return', *The Review of Economics and Statistics*, Vol. 54, No. 4, pp.412–423.
- Headen, R.S. and Lee, J.F. (1974) 'Life insurance demand and household portfolio behaviour', *Journal of Risk and Insurance*, Vol. 41, No. 4, pp.685–698.
- Huber, P.J. (1973) 'Robust regression: asymptotics, conjectures and Monte Carlo', *Annals of Statistics*, Vol. 1, No. 5, pp.799–821.
- Ismail, M. (2013) 'Determinants of financial performance-the case of general Takaful and insurance companies in Malaysia', *International Review of Business Research Papers*, Vol. 9, No. 6, pp.111–130.
- Kannou, M. (2007) 'Solvency and solvency margin', *Management and Finance – The African Reinsurer*, Vol. 21, No. 1, pp.36–41.
- Kaya, E.O. (2015) 'The effects of firm-specific factors on the profitability of non-life insurance companies in Turkey', *International Journal of Financial Studies*, Vol. 3, No. 4, pp.510–529.
- Kozak, S. (2011) 'Determinants of profitability of non-life insurance companies in Poland during integration with the European financial system', *Electronic Journal of Polish Agricultural Universities*, Vol. 14, No. 1, pp.97–106 [online] <http://www.ejpau.media.pl/articles/volume14/issue1/art-01.pdf> (Accessed 19 July 2015).
- Leflaive, V. (2001) 'Insurance and private pensions compendium for emerging markets', *OECD*.
- Li, Y. (2007) *Determinants of Banks Profitability and Its Implication on Risk Management Practices: Panel Evidence from the UK*, University of Nottingham.
- Liebenberg, A.P. and Sommer, D.W. (2008) 'Effects of corporate diversification: evidence from the property-liability insurance industry', *Journal of Risk and Insurance*, Vol. 75, No. 1, pp.893–919.
- Majumdar, S.K. (1997) 'The impact of size and age on firm level performance: some evidence from India', *Review of Industrial Organization*, Vol. 12, No. 2, pp.231–241.
- Malik, H. (2011) 'Determinants of insurance companies profitability: an analysis of insurance sector of Pakistan', *Academic Research International*, Vol. 1, No. 3, pp.315–321.
- Mehari, D. and Aemiro, T. (2013) 'Firm specific factors that determine insurance companies' performance in Ethiopia', *European Scientific Journal*, Vol. 9, No. 10, pp.1857–7431.

- Miniaoui, H. and Chaibi, A. (2014) *Technical Efficiency of Takaful Industry: A Comparative Study of Malaysia and GCC Countries*, Working papers, Department of Research, Ipag Business School, Paris [online] [https://www.ipag.fr/wp-content/uploads/recherche/WP/ IPAG_WP_2014_055.pdf](https://www.ipag.fr/wp-content/uploads/recherche/WP/IPAG_WP_2014_055.pdf) (accessed 10 August 2015).
- Moro, O. and Anderloni, L. (2014) 'Non-life insurance economic performances – an empirical investigation', *Journal of Economics and Management*, Vol. 18, No. 1, pp.160–177.
- Najjar, N. (2012) 'The impact of corporate governance on the insurance firm's performance in Bahrain', *International Journal of Learning and Development*, Vol. 2, No. 2, pp.1–17.
- Outreville, J.F. (1990) 'The economic significance of insurance markets in developing countries', *Journal of Risk and Insurance*, Vol. 57, No. 3, pp.487–498.
- Pervan, M. and Pavić, K.T. (2010) 'Determinants of insurance companies' profitability in Croatia', *The Business Review Cambridge*, Vol. 16, No. 1, pp.231–238.
- Rao, K., Ling, X., Barber, S.L., Yao, L., Qian, J., Cai, M., Xin, Y., Gao, J., Xu, K. and Boerma, J.T. (2010) *Changes in Health Service Use and Expenditure in China during 2003–2008: Results from the National Health Services Surveys*, May.
- Renaud, O. and Victoria-Feser, M. (2010) 'A robust coefficient of determination for regression', *Journal of Statistical Planning and Inference*, Vol. 140, No. 7, pp.1852–1862.
- Sen, S. and Madheswaran, S. (2007) 'Are life insurance demand and determinants valid for selected Asian economies and India?', Paper presented at the *11th Annual Meeting APRIA*, NCCU Taipei, 22–25 July 2007.
- Shiu, Y. (2004) 'Determinants of United Kingdom's general insurance company performance', *British Actuarial Journal*, Vol. 10, No. 5, pp.1079–1110.
- Swiss Re (2010) 'Global risk 2010: Aa global risk network report', *World Economic Forum Report in Collaboration with Citi Marsh and Mclennan Companies (MMC)*, Swiss Re Wharton School Risk Center, Zurich Financial Services.
- Ward, D. and Zurbrugg, R. (2002) 'Law, politics and life insurance consumption in Asia', *Geneva Papers on Risk and Insurance*, Vol. 27, No. 3, pp.395–412.
- Wright, K.M. (1992) *The Life Insurance Industry in the United States an Analysis of Economic and Regulatory Issues*, Country Economics Department, The World Bank Policy Research Working Paper (wps 857) [online] <http://core.ac.uk/download/pdf/6645034.pdf> (accessed 15 June 2015).