



Citation for published version:

Akhter, W, Pappas, V & Khan, SU 2017, 'A comparison of Islamic and conventional insurance demand: Worldwide evidence during the Global Financial Crisis', *Research in International Business and Finance*, vol. 42, pp. 1401-1412. <https://doi.org/10.1016/j.ribaf.2017.07.079>

DOI:

[10.1016/j.ribaf.2017.07.079](https://doi.org/10.1016/j.ribaf.2017.07.079)

Publication date:

2017

Document Version

Peer reviewed version

[Link to publication](#)

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Accepted Manuscript

Title: A comparison of Islamic and conventional insurance demand: Worldwide evidence during the Global Financial Crisis

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PII: S0275-5319(16)30487-1
DOI: <http://dx.doi.org/doi:10.1016/j.ribaf.2017.07.079>
Reference: RIBAF 769

To appear in: *Research in International Business and Finance*

Received date: 7-10-2016
Accepted date: 3-7-2017

Please cite this article as: Akhter, Waheed, Pappas, Vasileios, Khan, Saad Ullah, A comparison of Islamic and conventional insurance demand: Worldwide evidence during the Global Financial Crisis. *Research in International Business and Finance* <http://dx.doi.org/10.1016/j.ribaf.2017.07.079>

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A comparison of Islamic and conventional insurance demand: Worldwide evidence during the Global Financial Crisis

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October 2016

Highlights

- We compare the demand for conventional and Islamic insurance products
- Demand for Islamic insurance has been more resilient during the GFC
- The Islamic insurance demand is found to be unrelated to the saving rate
- Islamic insurance in the ASEAN region is deemed as a substitute to the conventional

Abstract

In this paper we compare the Islamic insurance industry (Takaful) to the conventional insurance across 14 countries over the 2005 – 2014 period. Our methodology relies on panel regressions and accounts for the periods during and post the global financial crisis (GFC). Specifically, we investigate: i) the difference in the insurance demand dynamics of the two insurance types; ii) if Islamic insurance demand has been boosted in the period that followed the crisis. To allow for cross-country heterogeneities we form sub-samples of high/low insurance regions and ASEAN/Middle East. We find Islamic and conventional insurance demand to be negatively affected by GDP/capita, albeit the Islamic showing a greater resilience during crisis. A negative link between conventional insurance and saving rate shows that conventional saving products work as substitutes to conventional insurance. Higher average income is positively (negatively) related to Islamic insurance demand in the Middle East (ASEAN), a finding plausibly related to the different practices relating to Islamic finance in the two regions.

Keywords: Islamic insurance (Takaful) • Global Financial Crisis • ASEAN • Middle East •

Demographics

JEL Classification: G22

1. Introduction

The Global Financial Crisis (GFC) of 2007/08 is considered to have started from the US banking sector. The adverse effects were not contained in the banking sector; they were rather spread across the economy. One sector that was hit quite hard is that of the insurance, mainly through the exposure of their investment portfolios to US mortgage and credit market, which were adversely affected by the subprime market operations. Highlighting the effect that the GFC has had on the insurance industry has been the unprecedented for a non-bank bailout package of \$85 billion by the US Federal Government to the largest, in terms of assets, insurance company, American International Group (AIG) (Schich, 2009; Harrington, 2009). The need for AIG's bailout was a big shock for market participants, possibly of a higher magnitude than the Lehman Brother collapse due to the AIG's interconnectedness with 71 US insurance companies and 176 other financial services companies. At the other side of the Atlantic Ocean, the European insurance market was in no better situation. For example, in Romania, the penetration of the insurance industry fell by 25% over a two-year period (Firtescu, 2014).

A fundamental reason as to why insurance companies have been hit quite hard by the GFC has been their high degree of interconnectedness with the banking sector through non-traditional business activities such as, raising premiums through "bancassurance" and investment of insurance funds in equity and bond market (Baluch et al., 2011). It is this high degree of interconnectedness that has been highlighted as a major systemic risk for the insurance industry, see for example Chen et al. (2013).

The impact of the GFC on the banking sector has been analysed thoroughly in the literature providing suggestions as to how the insurance industry could be better isolated (Lehmann and Hofmann, 2010; Eling and Schmeiser, 2010; Ashby, 2011; Baluch et al., 2011). Among the key results is that the risk management strategy of the banks should take into account the adverse effect it could have upon the insurance sector. Innovations in stress testing, improved communication channels and accountability and promoting better market discipline and financial conglomeration of insurance business for corporate risk diversification have been among the key suggestions.

Another, more recent, strand of the literature focuses on the impact of the GFC directly upon the insurance sector of developed (e.g., US, UK) and developing economies (e.g., Asia) (Harrington, 2009; Schich, 2009; Eling and Schmeiser, 2010; Lehmann and Hofmann, 2010; Ashby, 2011; Baluch et al., 2011; Berry-Stölzle et al., 2014; Trinh et al., 2015). For example, the study of Trinh et al. (2015) finds that non-life insurance during the GFC is associated with factors related to economic freedom, income, financial sector development, culture and legal system but only for developing countries.

Islamic insurance (*Takaful*) has also been studied with an aim to investigate the dynamics of these alternative products. *Takaful* has recorded a growth rate of 18% over the 2007–2012 period worldwide, while its growth in ASEAN countries (Malaysia, Indonesia, Brunei, Singapore and Thailand) has been

even higher, reaching 22%. Islamic insurance contribution had reached US\$18.3 billion by June 2013 and is projected to exceed the US\$20 billion mark by 2017 (El-Tahir, 2014; Ernst and Young, 2015). Given this profound growth of the industry, comparative studies between Islamic and conventional insurance products have focused on the identification of key economic factors affecting their demand (Redzuan, 2011; Hawariyuni and Salleh, 2012; Abdou et al., 2014).¹ Others have assessed the *Takaful*'s potential for future growth (Akhter, 2009; Rahman, 2009; Redzuan et al., 2009). However, up to date there has been no comparison between the conventional and the Islamic insurance industry with respect to the GFC impact. By contrast, there have been studies that compare the financial stability of conventional and Islamic banks during tranquil periods and crisis events (Čihák and Hesse, 2010; Pappas et al., 2016).

The aim in this paper is to investigate any differentiated impact of the GFC upon conventional and Islamic insurance. Secondly, we assess any sensitivity differences with regards to factors affecting the demand for the two insurance products. Our dataset extends over the 2005 – 2014 period and includes 14 Asian countries where conventional and Islamic insurance products are available. Our methodology uses a battery of t-tests to assess unconditionally the demand for conventional and Islamic insurance products before and after the GFC. Further, we analyse the demand for the two types of insurance products conditionally on key macroeconomic and demographic characteristics.

As a preview to our findings, Islamic and conventional insurance demand are negatively impacted by GDP/capita during periods of crisis, albeit the Islamic industry is more resilient. The significant negative link between conventional insurance and saving rate shows that conventional saving products work as substitutes to conventional insurance. However, this is not the case with Islamic insurance where demand is found to be unrelated to the level of the saving rate, a finding that is consistent with the ideology of Islamic finance and the refrain from interest rate use. In terms of demographics, we find Education to have a strong positive effect on Islamic insurance demand only. Our results also show that higher average income is positively (negatively) related to Islamic insurance demand in the Middle East (ASEAN). We believe this is attributed to the different schools of thought that influence the two regions, with Islamic finance being more liberal in the ASEAN region and therefore being regarded as substitute to conventional insurance. By contrast, in the Middle East, Islamic insurance is regarded as markedly different to conventional insurance often willingly purchased at a premium.

Our study contributes to the literature in two ways. We provide the first comparative study between determinants of demand for conventional and Islamic insurance products and assess the impact of the crisis in the two types of insurance products. The literature has compared conventional and Islamic banks from a variety of aspects such as, stability (Čihák and Hesse, 2010; Pappas et al., 2016), efficiency (Johnes et al., 2014; Saeed and Izzeldin, 2014), loan default rates (Baele et al., 2014), business model (Beck et al., 2013), credit risk (Abedifar et al., 2013) and accounting practices (Elnahass et al., 2014). However, Islamic insurance has remained relatively in the shade. A second contribution rests within the array of explanatory variables that generalize those used in studies pertaining to conventional insurance (e.g., Trinh et al., 2015). Specifically, our included indicators capture not only economic factors but also demographic characteristics such as, education that could highlight differences on the demand for

¹ Most of these studies have conducted a single country analysis focusing on Malaysia, which is the leading country in Islamic insurance products with both insurance systems coexisting.

conventional and Islamic insurance. Our results will be relevant to policy makers of countries where Islamic insurance constitutes an established or a rising alternative to conventional insurance products.

The paper is arranged in seven sections of which this is the first. Section 2 covers key background information related to the Islamic insurance in Asia. The literature is reviewed in section 3. Our methodology and data are presented in sections 4 and 5 respectively. A sixth section presents the results and discusses key findings and implications. A final section concludes.

2. Islamic Insurance Background

Insurance has emerged as a risk mitigating tool and has played a significant role in financial sector development and overall economic growth of major economies of the world (Moshirian et al., 2007; Haiss and Sümegi, 2008; Arena, 2008; Sherif and Shaairi, 2013). In the 1960s and till the early 1970s, around 93% of the world insurance market was held by the European and the Northern-American countries. The oil price shocks of the late 1970s together with the ensuing inflationary pressure had a declining effect on the proportion of the worldwide insurance market these countries took up, reaching to 56% in 2012 (Swiss Re, 2013). By contrast, during this period the share of emerging Asian economies² increased from 3.8% in 1960s to 30% in 2012. It was expected that emerging economies of Asian countries will lead the growth with an expected growth rate of 8% which is more than three time of advanced countries growth rate of 2.6% (Swiss Re, 2013; Sigma, 2013).

Accessibility of conventional insurance products in Muslim majority countries became questionable in the eyes of *Shariah* due to the prohibited elements of Riba (interest), Gharar (uncertainty) and Maisir (gambling) in insurance transactions. As such, *Islamic Insurance (Takaful)* emerged as an alternative to conventional insurance products to fulfil the needs of an increasing Muslim population that wanted to conduct its financial activities in a Shariah-compliant way (for details see Akhter, 2009; Ayub, 2003; Ayub, 2009; Billah, 2003; El-Gamal, 2001). Islamic insurance is based on the principles of mutual risk sharing and mutual support through enhanced society links. Islamic Insurance has shown remarkable growth in Muslim majority countries, predominantly the Far East Asia and the Gulf Cooperation Council (GCC) Countries. Even though Islamic Insurance is small compared to conventional insurance, its availability has spread to the West similarly to the expansion of the Islamic banking industry.

The global Islamic Insurance market is estimated around US\$25 billion at the end of 2015 and is estimated to reach over US\$20 billion by 2017 (EY, 2015). In line with the double-digit growth of Islamic finance markets, which are estimated at around US\$2 trillion, Islamic insurance enjoys phenomenal compounded annual growth of at least 14%, despite the non-negligible cross-country differences (EY, 2015). Globally, Islamic insurance only accounts for 1% of the insurance market; however, in Muslim-dominated countries its share is constantly rising.

The GCC and the ASEAN dominate the Islamic insurance industry, together accounting for more than 90% of the gross contributions as of 2014 (EY, 2015). In 2014, the Islamic insurance market in the GCC was at US\$8.9 billion in contribution volume, having expanded at an annual average growth rate of 28.4% since 2006. GCC accounts for nearly 70% of the Islamic insurance on the basis of the contributions with the most commonly used types of Islamic insurance being the General *Takaful* and Family *Takaful* (EY, 2015). The combined gross premium income of Islamic insurers in 2015 in the GCC region exceeded US\$10 billion, which compares favorably to roughly US\$9 billion corresponding to the conventional insurers of the region (Zawya, 2016). In terms of individual markets, Saudi Arabia and

²China, India and Japan were the main drivers behind this rapid insurance growth (Swiss Re, 2013; Sigma, 2013).

Malaysia are the dominant ones in the field, while Turkey and Indonesia are quickly emerging as significant players (EY, 2015).

3. Literature Review

Demand for insurance products is related to the economic and demographic environment of a country. From an economic perspective, income, inflation and main saving rate are identified as the key macroeconomic factors affecting demand for insurance products. Demographic factors, most notably related to health quality, educational quality and urbanization, have been found to affect the demand for insurance products.

Increased income is associated with a larger appetite for insurance policies as policy holders opt to save money for post-retirement consumption or as an endowment to their descendants. Several studies corroborate this finding using individual and aggregate level data over extensive cross-country and cross-time samples, see for example (Beenstock, Dickinson, and Khajuria, 1988; Truett and Truett, 1990; Browne and Kim, 1993; Outreville, 1996; Beck and Webb, 2003; Hwang and Gao, 2003; Ward and Zurbruegg, 2005; Redzuan et al., 2009; Gustina and Abdullah, 2012).

Contrary to income, inflation shows a negative relation to insurance demand reflecting a decreasing value effect for future assets and therefore the attractiveness of insurance products (Redzuan, Rahman and Aidid, 2009; Li, Moshirian, Nguyen and Wee, 2007). Babbel (1981) found that customers are sensitive to changes in inflation either in terms of expected or realized terms, with a most likely reaction towards reducing their appetite for insurance products. However, high but anticipated rates of inflation are likely to have a more muted effect on decreasing the demand of insurance products. Supporting to this contention is the study of Hwang and Gao (2003) that finds no adverse impact of the high inflation rates on the insurance industry of China. As the high inflation period was also a period of high and sustained economic growth, consumers were less responsive to the inflation negative effect as it did not affect people's living standard, according to the authors.

As the saving rate is considered a proxy for the rate of return on saving accounts offered by commercial banks; a negative relation between insurance demand and saving rate is quite anticipated as saving accounts are more flexible (e.g., in terms of maturity) than insurance products. Buyers do not prefer insurance policies if these offer lower returns compared to other financial instruments (e.g., saving accounts) prevailing in the market (Redzuan et al., 2009). The studies of (Beck and Webb, 2003; Savvides, 2006; Redzuan et al., 2009) corroborate these findings.

A high life expectancy is expected to induce a saving-for-retirement culture where saving during the working age for post-retirement takes place. This could lead to an increase for insurance products too (Savvides, 2006; Nesterova, 2008). If higher life expectancy prevails than ultimately prices for insurance products will be lower, especially for life insurance products; which could make such products more appealing (Sen, 2008). By contrast, a high life expectancy suggests that people will switch from mortality coverage insurance policies to insurance policies where the trigger is not tied to one's life (e.g., payment at retirement or at a certain age) or move to other alternatives (e.g., saving accounts) altogether (Browne and Kim, 1993; Beck and Webb, 2003).

Education is a well-regarded proxy for risk aversion. Outreville (1996) argues that highly educated individuals have more awareness and understanding of risk and risk management tools. Hence, education could increase risk aversion, which in turn could increase insurance products demand as these may be viewed as risk mitigating tool (Truett and Truett 1990; Burnett and Palmer 1984; Gandolfi and Miners 1996). Islamic insurance products have also been found to have a similar relation to educational qualities (Akhter and Hussain, 2012). By contrast, Anderson and Nevin (1975) find a negative association between education and demand for insurance products. In their explanations they claim that educated people may have a higher appreciation of inflations' power to reduce the future value of their accumulated capital from insurance products. However, this argument would receive reduced support if insurance products offer inflation protection. Browne and Kim (1993) argue that highly educated individuals may be family-dependent for a longer period, a fact that could negatively affect their demand for insurance products.

The link between insurance demand and dependency ratio is not a clear-cut one. It has been argued that a young dependency ratio positively affects mortality coverage demand for insurance, whereas old dependency ratio negatively affects mortality coverage (Lenten and Rulli, 2006; Ćurak and Kljaković-Gašpić, 2011). An important motive in purchasing insurance is the protection of family members from financial difficulties due to some premature death of wage earners. As such, higher dependents ratio would lead to increase insurance demand. Yet larger family size may limit the financial sources available to wage earners to run their family and hence reduce the insurance demand which results in negative relationship number of dependents with insurance consumption (Burnett and Palmer, 1984).

Insurance consumption is higher in those countries where a larger proportion of the population lives in urban areas. Urbanization shows a positive impact on insurance demand for reasons related to the higher economic development in urban areas but also the increased exposure to risk elements (e.g., criminality, air pollution)(Beck and Webb, 2003; Hwang and Gao, 2003).

Table 1 provides a summary of the relevant literature review. We distinguish between studies that have focused on the determinants of conventional insurance, of Islamic insurance and the impact of the Global Financial Crisis on insurance demand. Most are empirical (a mix of cross-sectional, time series and panel data frameworks) with a few theoretical studies.

[Table 1 here]

4. Methodology and Data

4.1 Data

Our main focus is the comparative demand for conventional and Islamic insurance products; hence our study focuses on 14 countries where both insurance options are available to customers, while

the time period under study extends from 2005 – 2014 giving us good coverage of the Global Financial Crisis.³

From a geographical perspective the included countries are part of South Asia (Bangladesh, Pakistan, Sri Lanka), ASEAN (Indonesia, Malaysia and Thailand) and Middle East (Bahrain, Iran, Jordan, Kuwait, Lebanon, Qatar, Saudi Arabia, United Arab Emirates). These three regions account for 95% of the total Islamic insurance market although there is a considerable degree of cross-country demand for insurance products (EY, 2015).

The dependent variable in the analysis is the insurance demand as % of GDP for conventional and Islamic insurance products. The conventional insurance is provided via the Swiss Re Sigma Reports, while the Islamic equivalent from the World Takaful Conference and Ernst & Young Takaful Reports.

Economic explanatory variables include GDP per capita in USD, as a proxy for economic prosperity, the percentage change in the CPI as a proxy for inflation and the deposit rates offered by commercial banks as a proxy for the saving rate. Explanatory variables relate to demographics include the secondary level of *education* completion rate, as a proxy for the level of awareness and risk aversion; the *dependency ratio*, which is the ratio of younger than 15 or older than 64 people to the working age population; *Life expectancy* in years and the percentage of urban population that lives in an urban area (*Urbanization*). All data are obtained through the World Development Indicators database.

4.2 Model

We estimate the following equation for conventional and Islamic insurance product demand

$$y_{it} = \beta'X + v_i + \varepsilon_{it}$$

where i and t index country and year respectively, X is the matrix of explanatory variables, v_i is the random effects term and ε_{it} the stochastic error term. The equation is estimated using panel random effects with cluster robust standard errors.

5. Results

5.1 Descriptive Statistics

Table 2 presents key descriptive statistics for the dependent and independent variables used in the study. Statistics are presented for the crisis (2005-2008) and Post-crisis periods (2009-2014), while a series of paired sample t-tests used to compare variability occur over the two periods.

A first read of the results shows that demand for conventional insurance is much more prominent form of insurance, accounting for 1.7% of GDP pre-crisis compared to around 0.2% of the Islamic one. Unconditional results show that insurance demand increases significantly during the crisis period, a result confirmed for both conventional and insurance products. However, Islamic insurance records a more pronounced increase of around 47.3% compared to a 12.8% that the conventional insurance shows.

³ A few countries with dual insurance system are excluded due to data availability issues.

The crisis affects most of the economic and demographic variables of interest. However, as most of the economic variables are known to react slowly to financial developments, such as the Global Financial Crisis, it may be expected that GDP/capita, Inflation and Saving rates do not instantly adjust to the new conditions. As such, and having established firm links between these variables and insurance demand (see Table 1), it is interesting to see how the sensitivity of insurance demand changes between pre-crisis and crisis.

[Table 2 around here]

5.2 Determinants of Insurance demand

Table 3 presents estimated coefficients and standard errors for the regression models on conventional and Islamic insurance demand for the pre-crisis and crisis periods.

[Table 3 around here]

For both the Islamic and the conventional insurance demand, GDP per capita shows a negative impact in the crisis period. However, Islamic insurance demand is less adversely affected by the crisis as evidenced by the lower (in absolute value) coefficient. A negative relationship between GDP/capita and insurance demand has been evidenced previously for Asian countries; see for example the studies of Truett and Truett (1990), Browne and Kim (1993), Beck and Webb (2003), Gustina and Abdullah (2012), Hwang and Gao (2003), Ward and Zurbruegg (2005). In part this negative relationship is attributed to the highly unequal income distribution and the economic uncertainty that negatively affect insurance demand. This is due to the fact that people at a high income band would be interested in alternative financial products for financial protection (e.g., saving accounts), while those of a low income band would be prioritizing other needs instead. For Islamic insurance specifically, the relatively young age of the industry coupled with a low level of awareness around participatory financial schemes (Islamic insurance or Islamic finance in general) may act as additional deterrents. Inflation shows significant positive impact over the demand for conventional and Islamic insurance during pre-crisis and crisis periods. High inflation is associated with increased uncertainty; a typical finding of the sampled countries. As such, risk mitigating tools would be welcomed in an economy with high uncertainty for financial protection from contingent losses (Hwang and Gao, 2003; Gustina and Abdullah, 2012). Saving rate shows a significant negative link only for the conventional insurance products. Therefore, demand for Islamic insurance seems to be governed by different dynamics compared to the conventional one, with saving accounts (the key competitor to insurance products) not acting as strict substitutes.

Education has a positive impact on insurance demand, which however is stronger for the case of Islamic insurance products. This could be an indication that the clientele of Islamic insurance firms is more educated, *ceteris paribus*. Dependency ratio shows a negative link for the Islamic insurance products and for both periods of pre-crisis and crisis. It shows that a higher dependency ratio will lower the demand for insurance products. An economy with a low dependency ratio is a more fertile ground for an insurance firm as there is a relatively low number of possible claims coming through (Ćurak and Kljaković-Gašpić, 2011). As such, and with Islamic insurance representing a more niche market, it may be expected to suspect that the development of such insurance schemes would require an even more

fruitful economic climate, as this may be represented by a low dependency ratio. Urbanization positively affects Islamic insurance demand, albeit there is no significant effect for the conventional counterpart. The finding is partially reflective of the financial and industrial development, quality of life and awareness of financial products and services that is typically associated with a larger city. It also highlights the potential dangers from which the urban population may be seeking protection (Hwang and Gao, 2003). Life expectancy is not statistically related to insurance demand of either type.

5.3 Regional Analysis of Insurance demand

In this section we provide a regional analysis of the determinants of conventional and Islamic insurance demand. The first classification is based on insurance penetration with the countries being classified into High and Low penetration regions. High insurance penetration countries⁴ consist of Bahrain, Indonesia, Jordan, Lebanon, Malaysia, Thailand and the United Arab Emirates, while Low insurance penetration includes Pakistan, Srilanka, Bangladesh, Qatar, Kuwait, Saudi Arabia and Iran.

The second is based on geographical basis with the Middle East countries forming one group and the ASEAN with the South Asian countries another. Tables 4 and 5 present the results for the first and second classification respectively.

[Tables 4 and 5 around here]

A comparison between the high and low insurance penetration regions reveals that GDP/capita positively influences insurance demand of either type in the former group, while it acts as a deterrent in the latter group. Most importantly, during crisis demand for insurance products rises with the GDP/capita in the High penetration group, while it decreases in the Low penetration group. This could be in part driven by the higher financial development⁵ in some countries of the High penetration group and the associated familiarity of their population with insurance products.

A similar story is true for the inflation and saving rates both of which carry the expected signs for the High penetration group. For example, higher rate of inflation could increase the demand for insurance products as uncertainty in the economy would be rising. By contrast, in the Low insurance group only the Islamic insurance carries the positive sign, which could indicate a disbelief in the conventional insurance products in this region. Saving rate is not statistically significant for the Low insurance group, albeit it carries the expected negative sign in the High penetration group corroborating the concept of substitutability of insurance and saving products.

In terms of demographics, the High insurance group shows a greater sensitivity to factors like Education, Life Expectancy and Urbanization albeit the same direction is observed for both the High and the Low insurance groups. The higher sensitivity in the High insurance penetration group could be reflective of the different priorities of the citizens of these countries. Demographics do not show substantial differences between type of insurance product or period.

⁴ Here, after taking the median we have equally distributed the whole sample into Higher and Lower Insurance Penetration Countries.

⁵ In the Higher insurance group Malaysia, Indonesia and Lebanon has shown a decline in market capitalization growth rates with -1.25%, -1.31% and -9.78% respectively while in lower penetration group Pakistan, Kuwait, Saudi Arabia and Bangladesh represents decline in growth rates of market capitalization with -13.78%, -16.44%, -13.78% and -7.41%.

A comparison between the ASEAN⁶ and the Middle East region shows that larger GDP/capita positively (negatively) affects Islamic insurance demand in the Middle East (ASEAN). The opposite is observed with conventional insurance which seems to be positively affected by GDP/capita in the ASEAN and negatively in the Middle East. A plausible argument about this apparent difference may have to do with the acceptance of Islamic/conventional finance in these two parts of the world. In particular, the Middle East region is known for advocating a stricter model of Islamic finance relatively to the countries of ASEAN (with Malaysia as a proponent). As such, in the Middle East and as the average income increases people may switch to Islamic insurance over conventional insurance products, a finding which is in line with the rationale provided in El-Gamal (2011) about customers willing to pay higher prices to have “peace of mind”. By contrast, in the more liberal ASEAN, conventional and Islamic finance (and consequently the insurance products) are closer substitutes, often offered by the same bank holding company. For example, CIMB, one of Malaysia’s largest banks offers conventional and Islamic financial products under one roof.

Inflation and saving rate carry the expected sign in both regions, with inflation being a higher concern to insurance users of the Middle East, as evidenced by the higher coefficient (in absolute values) across most specifications.

Among the demographic variables, higher education appears to influence positively Islamic insurance demand in the Middle East but not the ASEAN, with possible reasons related to the different models of Islamic finance practiced in the two regions as mentioned previously. Life expectancy is more of a concern in the countries of ASEAN as the highly statistically significant coefficients suggest. In particular, higher life expectancy is expected to increase insurance demand of either type. However, this effect is not verified in the Middle East. The dependency ratio and the urbanization variables affect insurance demand negatively and positively respectively and do not show any remarkable difference between the two regions.

6. Conclusion

The global financial crisis has brought to surface several malpractices in the banking and insurance sectors. Islamic finance that highlights risk sharing and the shunning of interest rates and complex financial instruments has emerged as a viable alternative. In this paper we compare the Islamic insurance industry (Takaful) to the conventional insurance across 14 countries where both products may be found over the 2005 – 2014 period. Our methodology relies on panel regressions across different classifications. Specifically, we split the sample into high/low insurance regions and ASEAN/Middle East to allow for varying cross-country heterogeneities. Our key control variables capture economic and demographic criteria.

Our findings show that Islamic and conventional insurance demand are negatively impacted by GDP/capita during periods of crisis. However, the Islamic industry is more resilient. A significant negative link between conventional insurance and saving rate shows that conventional saving products work as substitutes to conventional insurance. However, this is not verified in the case of Islamic insurance, where demand is found to be unrelated to the level of the saving rate. This is an expected

⁶South Asian countries are merged with ASEAN region as their share to total Takaful contributions is about 3% (EY, 2015).

finding given the shunning of interest rate and the use of profit share ratios and equity financing in Islamic finance. In terms of demographics, we find Education to have a strong positive effect on Islamic insurance demand only. Islamic insurance demand, in line with the rising popularity of Islamic finance, seems to have been boosted following the financial crisis, particularly in the high insurance region. Our results also show that higher average income is positively (negatively) related to Islamic insurance demand in the Middle East (ASEAN). We believe this is attributed to the different schools of thought that influence the two regions, with Islamic finance being more liberal in the ASEAN region and therefore being regarded as substitute to conventional insurance. By contrast, in the Middle East, Islamic insurance is regarded as markedly different to conventional insurance often willingly purchased at a premium. We believe that our results are useful to policy makers, regulators and insurance providers.

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Table 1: Studies on Insurance

Study	Time Period	Method	Countries	Key Research Findings
<i>Conventional Insurance</i>				
Fortune (1973)	1964-1971	Emp.Std.	US	High sensitivity between the optimal amount of life insurance, wealth and the real interest rate.
Beenstock, Dickinson & Khajuria (1986)	1970-1981	Emp.Std. (Panel)	10 Countries	Average age, life expectancy, dependency ratio, income and interest rate (positive impact) social security coverage (negative impact).
Truett & Truett (1990)	1964-1984	Emp.Std.	Mexico and US	Age, level of education and income significant impact
Brown & Kim (1993)	1980, 1987	Emp.Std. (Cross sectional)	45 Countries	Income and social security expenditures positively while inflation have negative impact
Beck & Webb (2003)	1961-2000	Emp.Std. (Panel)	68 Countries	Per capita income. Banking sector development, private saving rate, real interest rate and old dependency (positive Impact) schooling, inflation, young dependency and anticipated inflation (negative Impact).
Outreville (1996)	1986	Emp.Std. (Cross sectional)	45 Developing	Price of insurance, personal disposable income and level of financial development significant impact
Ward & Zurbruegg (2002)	1987-1998	Emp.Std. (Panel)	37 Asian & OECD	Improved civil rights, political stability, Income level, inflation rate, insurance price charged as premiums and provisions for social welfare significantly improve the insurance demand
Hwang & Gao (2003)	1986-1996	Emp.Std. (Time Series)	China	Positive impact of Income, Education, Urbanization. Inflation impact positive but insignificant.
Li, Moshirian, Nguyen & Wee (2007)	1993-2000	Emp.Std. (Panel)	30 OECD	Income elasticity, number of dependents, level of education, financial development and Competition (positive impact) life expectancy, social security expenditure, inflation and real interest rate (negative impact).

Nesterova (2008)	1996-2006	Emp.Std. (Panel)	14 European Countries	Higher life expectancy at birth, income level, old dependency ratio (positive impact) financial development indicator, inflation and real interest rate (negative impact)
Çelik & Kayali (2009)	2000-2006 Average	Emp.Std.	31 European Countries	Population and income on demand for life insurance is positive, education level and inflation negative impact
Feyen, Lester and Rocha (2011)	2000-2008	Emp.Std. (Panel)	90 Developed & Developing Countries	Income, population, population density, Age dependency, private ownership, Strong legal framework (positive impact) Inflation and Life expectancy (negative impact)
Kjosevski (2012)	1998 - 2010	Emp.Std. (Panel)	14 Central & South- Eastern European Countries	GDP per capita, inflation, health expenditure, level of education and rule of law significant impact
Sen & Madheswaran (2013)	1994-2008	Emp.Std. (Panel)	12 Asian Countries	Income, Financial Depth, Inflation, real Interest rate and youth dependency ratio are significant determinants for life insurance demand
Dragos (2014)	2001–2011	Emp.Std. (Panel)	17 Asian & European Countries	Income non-significant for non-life in Asia, Urbanization and education significant impact on life and non-life insurance
<i>Islamic Insurance (Takaful)</i>				
Redzuan, Rahman and Aidid (2009)	1985-2007	Emp.Std. (Time Series)	Malaysia	Income per capita, long-term interest rate and composite stock index significant impact
Gustina and Abdullah (2012)	1990-2009	Emp.Std. (Time Series)	Malaysia	GDP per capita, education, saving and religion are significant to family takaful while GDP per capita, saving and religion significant to life insurance
Yazid, Arifin, Hussin and Daud (2012)	-----	Theor.Std.	Malaysia	Income, interest rate, financial development, life expectancy, dependency ratio, education and urbanization (positive impact expectations) inflation, saving (negative impact expectations)

Sherif and Shaairi (2013)	1986-2010	Emp.Std. (Time Series)	Malaysia	Income, Islamic banking development, education, dependency ratio and Muslim population factors (positive impact) inflation, real interest rate, financial development and life expectancy (negative impact)
Redzuan (2014)	1970-2008	Emp.Std. (Time Series)	Malaysia	Income, education level, and Employees Provident Fund (EPF) are among significant predictors of the life insurance and family Takaful consumption
<i>Global Financial Crisis and Insurance</i>				
Schich (2009)	2007-2009	Theor.Std.	OECD Countries	Financial crisis has increasingly visible impact on the insurance industry, primarily through their investment portfolios, as the crisis spread and financial market valuations and the outlook for real activity deteriorated significantly.
Ashby (2011)	-----	Theor.Std. (Experts Interviews)	UK	Insurance regulatory reforms required regarding Capital requirements, quantitative risk assessments, improved disclosure rules and emphasize on risk management guidance and supervisory rules.
Baluch, Mutenga & Parsons (2011)	2004-2009	Theor.Std.	S&P Indexed Firms	Due to GFC banks and insurers have diversified from their traditional set of core activities and have become participants in each other's markets (e.g. insurers in the equity, fund and bond market and banks in insurance-linked securities).
Firtescu (2014)	2002-2011	Emp.Std. (Panel)	29 European Countries	For the period before crisis, continuous increase in the share of insurance industry revenue from premiums earned. Level of employment, GDP per capita and access to internet has significant positive influence.
Trinh et al. (2015)	2000-2011	Emp.Std. (Panel)	67 Countries	Economic freedom, income, bank development, culture, and law system are the key drivers for non-life insurance

Table 2: Descriptive Statistics

Variables	Crisis		Post-Crisis		Paired sample t-statistic
	Mean	SD	Mean	SD	
Conventional Insurance	1.708	1.202	1.943	1.359	2.408**
Islamic Insurance	0.197	0.360	0.316	0.399	3.398***
<i>Economic</i>					
GDP/capita	3.770	0.660	3.930	0.596	2.297**
Inflation	2.121	0.069	2.168	0.098	5.886***
Saving Rate	2.482	0.594	2.535	0.446	0.806
<i>Demographic</i>					
Education	8.620	2.300	8.411	2.615	-0.750
Dependency ratio	47.929	14.028	43.214	14.241	-5.73***
Life expectancy	73.096	3.420	74.349	3.458	7.875***
Urbanization	64.990	27.430	66.564	27.214	5.074***

Notes: This table shows key descriptive statistics for conventional and Islamic insurance demand as well as key economic and demographic variables used in the analysis. SD denotes Standard Deviation. Crisis and post-crisis periods are (2005-08) and (2009-2014) respectively. **, *** denote statistical significance at the 5, 1% level.

Table 3: Insurance demand regression results

Variables	Conventional		Islamic	
	Crisis	Post-Crisis	Crisis	Post-Crisis
<i>Economic</i>				
GDP/capita	-0.591** (0.196)	-0.314 (0.152)	-0.392** (0.163)	-0.151 (0.063)
Inflation	0.825 (0.850)	0.681** (0.323)	0.258 (0.360)	0.903*** (0.241)
Saving Rate	-0.322* (0.163)	-0.847*** (0.218)	-0.080 (0.115)	-0.023 (0.071)
<i>Demographic</i>				
Education	0.008 (0.055)	0.028* (0.021)	0.092*** (0.025)	0.017** (0.008)
Dependency ratio	-0.005 (0.014)	-0.033 (0.022)	-0.029*** (0.006)	-0.013** (0.006)
Life expectancy	0.292 (0.090)	0.104 (0.779)	0.048 (0.036)	0.193 (0.018)
Urbanization	0.009 (0.016)	0.036 (0.061)	0.009* (0.004)	0.010** (0.005)
Constant	-15.429**	-1.082**	4.883**	-3.675***
<i>adjusted R</i> ²	0.2798	0.3325	0.5239	0.3644
<i>N</i>	56	84	56	84

Notes: This table shows estimated coefficients and standard errors in brackets for conventional and Islamic insurance demand. Estimation is done via panel random effects with cluster robust standard errors. Crisis and post-periods are (2005-2008) and (2009-2014) respectively. *, **, *** denote statistical significance at the 10, 5, 1% level.

Table 4. Insurance demand regression results

Variables	Conventional		Islamic	
	Crisis	Post-Crisis	Crisis	Post-Crisis
<i>Panel A: High Insurance Region</i>				
<i>Economic</i>				
GDP/capita	0.703*** (0.264)	0.894** (0.401)	0.347 (0.190)	0.871*** (0.188)
Inflation	-0.014 (0.016)	0.902** (0.369)	0.571 (0.664)	0.311*** (0.103)
Saving Rate	-0.507* (0.353)	-0.926*** (0.284)	-0.290* (0.151)	-0.640*** (0.156)
<i>Demographic</i>				
Education	-0.592 (0.499)	0.562** (0.245)	0.249*** (0.058)	0.011* (0.022)
Dependency ratio	-0.273** (0.122)	-0.057 (0.047)	-0.049*** (0.009)	-0.007* (0.004)
Life expectancy	0.390*** (0.078)	0.060 (0.113)	0.331** (0.143)	0.022 (0.043)
Urbanization	0.094** (0.022)	0.264** (0.111)	0.132** (0.053)	0.040*** (0.005)
Constant	-49.05***	-5.360***	-5.970***	-2.790**
R ² (Within)	0.7687	0.6095	0.8091	0.9076
N	28	42	28	42
<i>Panel B: Low Insurance Region</i>				
<i>Economic</i>				
GDP/capita	0.461 (0.389)	-0.957*** (0.166)	-0.434** (0.188)	-0.115*** (0.037)
Inflation	-0.834** (0.418)	-0.691* (0.405)	0.424* (0.229)	0.088* (0.052)
Saving Rate	-0.164 (0.156)	-0.133 (0.222)	-0.019 (0.062)	-0.022 (0.012)
<i>Demographic</i>				

Education	0.045** (0.023)	0.020* (0.013)	-0.018 (0.015)	0.008* (0.010)
Dependency ratio	-0.046*** (0.015)	-0.009*** (0.002)	-0.003 (0.009)	-0.003** (0.001)
Life expectancy	0.253 (0.349)	0.113 (0.028)	0.014 (0.037)	0.004 (0.005)
Urbanization	0.605 (0.344)	0.009*** (0.002)	0.038* (0.020)	0.020*** (0.004)
Constant	-21.17***	-8.44***	-1.791	-0.804***
<i>adjusted R</i> ²	0.2517	0.6804	0.5068	0.6708
<i>N</i>	28	42	28	42

Notes: This table shows estimated coefficients and standard errors in brackets for conventional and Islamic insurance demand. Standard errors are represented in (.). Estimation is done via panel random effects with cluster robust standard errors. Crisis and post-periods are (2005-2008) and (2009-2014) respectively. *, **, *** denote statistical significance at the 10, 5, 1% level.

Table 5. Insurance demand regression results

Variables	Conventional		Islamic	
	Crisis	Post-Crisis	Crisis	Post-Crisis
<i>Panel A: ASEAN</i>				
<i>Economic</i>				
GDP/capita	0.118* (0.083)	0.762*** (0.169)	-0.299*** (0.056)	-0.133*** (0.059)
Inflation	-0.144 (0.216)	-0.777* (0.513)	0.463** (0.213)	0.073** (0.280)
Saving Rate	-0.093 (0.759)	-0.823 (0.574)	-0.028 (0.072)	-0.172*** (0.089)
<i>Demographic</i>				
Education	-0.346 (0.117)	-0.273*** (0.069)	-0.035* (0.011)	-0.032* (0.010)
Dependency ratio	0.029 (0.027)	-0.029* (0.0039)	-0.013*** (0.003)	-0.034*** (0.006)
Life expectancy	0.535*** (0.125)	0.282*** (0.103)	0.094*** (0.013)	0.153*** (0.016)
Urbanization	0.028** (0.010)	0.014 (0.011)	0.007*** (0.001)	0.011*** (0.002)
Constant	-34.69***	-14.99***	-7.240***	-11.44***
R ² (Overall)	0.9720	0.9541	0.9638	0.9399
N	24	36	24	36
<i>Panel B: MIDDLE EAST</i>				
<i>Economic</i>				
GDP/capita	-0.450*** (0.089)	-0.574*** (0.030)	0.058* (0.038)	0.750*** (0.134)
Inflation	-0.523* (0.318)	-0.187*** (0.019)	0.621* (0.696)	0.681*** (0.367)
Saving Rate	-0.502*** (0.526)	-0.164 (0.278)	-0.012 (0.301)	-0.552*** (0.122)
<i>Demographic</i>				

Education	-0.169 [*] (0.103)	-0.055 (0.047)	0.231 ^{***} (0.059)	0.014 (0.021)
Dependency ratio	-0.016 [*] (0.011)	-0.024 [*] (0.011)	-0.032 ^{***} (0.007)	-0.007 [*] (0.004)
Life expectancy	0.149 ^{**} (0.070)	0.171 (0.026)	0.046 (0.040)	0.013 (0.012)
Urbanization	0.038 ^{***} (0.012)	0.010 (0.011)	0.024 ^{***} (0.007)	0.042 ^{***} (0.005)
Constant	4.02 ^{***}	5.314 ^{**}	-3.113 ^{***}	-2.199 ^{***}
<i>adjusted R</i> ²	0.8882	0.8783	0.8678	0.9230
<i>N</i>	32	48	32	48

Notes: This table shows estimated coefficients and standard errors in brackets for conventional and Islamic insurance demand. Estimation is done via panel random effects with cluster robust standard errors. Crisis and post-periods are (2005-2008) and (2009-2014) respectively. *, **, *** denote statistical significance at the 10, 5, 1% level.