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Article

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Does insurance promote economic growth: A comparative study of developed and emerging/ developing economies

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Abstract: This paper examines the relationship between insurance and economic growth in 20 countries for the period 2006–2015. Insurance activity is measured through three distinctive proxies such as net written premiums, penetration and density. The Hausman statistics confirmed that fixed effect model is appropriate for this data-set. This study found a positive and a significant relationship between life insurance, measured through net written premiums and density, and economic growth for developed countries while the same is true for developing countries when insurance is measured through penetration proxy. The results also reveal that non-life insurance has statistically significant, for all three proxies, relationship with economic growth for developing countries whereas, in case of developed countries, the results are only significant when insurance density is used as a proxy for insurance. Moreover, the role of non-life insurance is more significant for developing countries as compared to developed countries.

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PUBLIC INTEREST STATEMENT

Insurance performs similar functions as banking sector and the market stock; however, limited studies are available about the contribution of insurance from an economic perspective. Statistics reveal that the share of insurance sector is approximately 6.23% in world gross domestic product. Yet, given the huge contribution of insurance to the economy as a whole, insurance also promotes a greater sense of security, peace of mind, reduction in anxiety and fear among individuals, businesses and governments. To individuals, insurance purchase enables an individual to sustain his continuous consumption of his property in the case of theft or damaged. Insurance enables businesses to operate in a cost-effective manner by providing risk transfer mechanisms. To the Government, on the other hand, expenditure on damages caused by natural disasters such as fire, flood and other natural disasters is reduced if not eliminated due to insurance purchase.

Subjects: Economics, Finance, Business & Industry; Finance; Insurance

Keywords: insurance; life insurance; non-life insurance; economic growth

1. Introduction

The importance of insurance, like other financial institutions such as banking and the stock market, is vital for the sustainable economic growth of any country. The risk is inherent in every human activity ranging from social life to economic activities (Din, Angappan, & Baker, 2017). The importance of insurance cannot be denied because of its economic outlook, for instance, insurance spending is 6.23% of World's GDP (Sigma Swiss-Re, 2016). More precisely, insurance spending for developed countries is around 8–11% whereas it is 2–4% for developing countries (Din et al., 2017; Outreville, 2013). However, statistics revealed a significant reduction, from 88–67%, in the share of developed countries premium since 2005 and an upward shift in insurance premiums for emerging and developing countries (Swiss-Re, 2016).

Human behaviour, particularly risk aversion, would either lead towards avoiding these activities or excessive precaution and both of these actions would result in a social loss (Masum Billah, 2014). In absence of risk transferor entities like insurance, the stock market and the banks, the volume of such economic activities would be much lower and hence will result in an economic loss (Gollier, 1991; Ward & Zurbruegg, 2000). Insurance not only helps to smooth out the volatile economic condition (Chau, Khin, & Teng, 2013) but insurance contracts are more stable than bonds, notes, and they are an exchange of money now for money payable contingent on the occurrence of certain events (Arrow, 1921). According to the Orthodox view of insurance, it is a key instrument of risk transferring, indemnification and intermediation (Cummins & Verand, 2007; Lester, 2009; Outreville, 1990, 1994, 2013, 2015; UNCTAD, 2007).

Prudent individuals do not prefer risk; however, if unavoidable they either keep aside an accumulated surplus or maintain a sinking fund to meet the contingency. These options, accumulation or sinking fund, soak up the scarce resource, either are of no use unless contingency or insufficient to restore the position of individual. Resultantly, society will suffer from existence of risk, through exposure to the chance of reduction in general well-being due to unproductive use of resources, or fail to achieve the desired outcome. Risk transferring to the third party will reduce fear, anxiety, frustration, demoralisation or melancholy (Willett, 1901). Besides removing exaggerated fear, insurance encourages creativity, innovation, entrepreneurial activities and trade that are vital for sustainable economic growth (Cristea, Marcu, & Cârstina, 2014; Masum Billah, 2014). The underlying conception of risk sharing, in modern insurance is adopted from the practice followed by the merchants at Edward Lloyd coffeehouse of London (Liu & Lee, 2014).

Past researchers who explored the relationship between financial sector and economic growth mainly focused either on banking sector or stock market (Horng, Chang, & Wu, 2012; Levine, 1997; Merton & Bodie, 1995) while insurance remained ignored (Haiss & Sümegi, 2008; Njegomir & Stojić, 2010; Verma & Bala, 2013). Literature reported that five possible relationships could exist between insurance and economic growth negative (Zouhaier, 2014)[1], demand following (Ching, Kogid, & Furuoka, 2010), supply following[2] (Ward & Zurbruegg, 2000), interdependence (Ghosh, 2013) and no relationship at all (Haiss & Sümegi, 2008; Omoke, 2012). Previous studies claimed that the role of insurance in promoting economic growth is not constant rather it follows S-shape curve, for instance, insurance plays little role for developed economies (Arena, 2008; Guochen & Chiwei, 2012; Haiss & Sümegi, 2008; Han, Li, Moshirian, & Tian, 2010; Ward & Zurbruegg, 2000). In addition, studies that have been conducted to examine the relationship between insurance and economic growth utilised a single proxy such as net written premiums, penetration or density, however, the proxy choice could also affect the outcome.

The remainder of this article is organised as follows. The next section presents the institutional setting in the sample countries and reviews the literature in the field. Then the methods employed in this study are discussed followed by the research findings. The final section concludes.

2. Literature review

Studies that examined the relationship between insurance and economic growth can be counted on fingers. The study of Ward and Zurbruegg (2000) is considered to be the first that explored the relationship between insurance and economic growth for OECD countries. They measured insurance through total insurance premium proxy and apply Granger Causality to study demand or supply following relationship between insurance and economic growth. The results revealed that in some OECD countries economic growth Granger Cause insurance demand and the reverse is true for others. It is important to mention here that authors found an insignificant relationship for two OECD countries namely UK and USA. Kugler and Ofoghi (2005) also investigated the relationship between insurance and economic growth using disaggregated data. They found a significant and a positive relationship between insurance and economic growth for the UK. They argued that an insignificant result of Ward and Zurbruegg (2000) was due to use of aggregate data (life plus non-life insurance premiums).

Haiss and Sümegi (2008) apply panel data analysis over the period of 1992–2004 for 29 OECD countries to explore the relationship between insurance and economic growth. They found that insurance differently affects economic growth of countries, for example, life insurance has become more significant for 15 OECD countries while non-life insurance has the same for rest of the 14 countries. Likewise, Ege and Bahadır (2011) also explore the relationship between insurance and economic growth on the panel data of 29 OECD over the period of 1999–2008, utilising the generalised method of moments (GMM). Results indicate that there is a positive and significant relationship between insurance and economic growth.

In addition, Chang, Lee, and Chang (2014) again examined the relationship between insurance and economic growth for 10 OECD. They apply bootstrapping Granger causality model over a period of 1979–2006. They revealed that one-way Granger causality running from all insurance activities to economic growth for France, Japan, Netherlands, Switzerland and the UK. Furthermore, economic growth Granger causes insurance activities in Canada (for life insurance), Italy (for total and life insurance) and the US (for total and non-life insurance). There is a two-way Granger causality between life insurance activity and economic growth in the US, while no causality between insurance activities and economic growth is found in Belgium (for all insurance), Canada (for total and non-life insurance), Italy (for non-life insurance) and Sweden (for life insurance). They justify their results as opposed to Ward and Zurbruegg's (2000) findings, (1) we utilise the most recent data for analysis and (2) they perform their analysis on country-to-country basis while we did it on panel framework.

A study conducted by Arena (2008) apply the generalised method of moments (GMM) on the panel data of 55 developed and developing countries for a period of 1974–2004 to investigate the relationship between insurance and economic growth taking insurance density as a proxy. They revealed that insurance at the aggregate level is significantly affecting the economic growth. Furthermore, they highlighted the, at the disaggregate level; effect of life insurance is significant for low-income countries whereas non-life is significant for developing and developed countries. Tong (2008) conducted a study to explore the relationship between insurance and economic growth for US, Germany, Sweden and South Korea. He utilised OLS, Fixed Effect and simultaneous equation modelling to investigate this relationship. He found life insurance has a significant and positive effect on economic growth for US, South Korea. However, the said relationship is negative in case of Sweden and Germany. The author claimed that as the government provides social benefits similar to life insurance, therefore, life insurance industry in European countries is not significantly contributing to the economy. On the other hand, non-life insurance has a significant and positive effect on economic growth for US, Germany, Sweden and South Korea.

Similarly, a study carried out by Kjosevski (2011) also investigated the relationship of insurance and economic growth for the Macedonia using the multiple regression models. Results highlighted that aggregate insurance industry and non-life insurance has a positive and significant effect on economic growth of Macedonia for the period 1995–2010. On the other hand, life insurance has significant but negatively affecting the economic growth of Macedonia. The author claimed that a strong banking sector (saving substitute and investment channel) could be the possible reason for the negative relationship between life insurance and economic growth for Macedonia. It is important to mention here that Tong (2008) measured insurance activity using total insurance premiums as a proxy for Europe, whereas, Kjosevski (2011) utilise insurance penetration to measure insurance activity for Macedonia.

Later on, Ćurak, Lončar, and Poposki (2009) apply fixed effect panel data test to again investigate the above-mentioned relationship for the 10 transitional countries over the period of 1992–2007. Authors established an argument, unlike the previous study where only life insurance promoting the economic growth, that insurance industry as a whole, life and non-life insurance all promotes economic growth for transitional countries. Similarly, Han et al. (2010) also explore the relationship between insurance and economic growth for 77 countries over the period of 1995–2004 using generalised methods of moments (GMM). The result supported the findings of Ćurak et al. (2009) that aggregate, non-life and life insurance have a much significant effect on economic growth for developing countries as compared to developed.

Although numerous studies presented above support the notion that insurance plays an imperative role in promoting economic growth via risk sharing, increased savings, higher investment and trade. However, it might lead to carelessness and fraud (Willett, 1901). For example, Zouhaier (2014) investigated the same relationship for 23 OECD countries using Fixed Effect Model. He found, contrary to Kjosevski (2011), a negative effect of aggregate and non-life insurance[3] on economic growth for OECD countries whereas the relationship is significant and positive if insurance penetration is used. In fact, Haiss and Sümegi (2008) argument can be cited here to support the findings of Zouhaier (2014), that insurance can drag down the economic growth of any country because of moral and morale hazard problem among the insured. Another possible argument to justify the negative relationship between insurance (total and non-life) and economic growth is, they use a different proxy to measure insurance activity, for example, insurance density.

A recent study by Din et al. (2017) investigated the relationship between insurance and economic growth for USA, UK, China, India, Malaysia and Pakistan using Pooled Mean Group (PMG/ARDL). They reported a positive and significant relationship between aggregate insurance, measured by net premiums and economic growth for all six countries. In addition, at disaggregate level; non-life insurance is also significantly associated with economic growth for all six countries. However, life insurance is only promoting economic growth for UK, India and Pakistan while the reverse is true for USA, China and Malaysia (Table 1).

Following hypothesis can be framed based on the literature presented in Table 1:

H1-Life Insurance significantly affects economic growth for developed countries.
H2-Life Insurance significantly affects economic growth for emerging/developing countries.
H3-Non-life Insurance significantly affects economic growth for developed countries.
H4-Non-life Insurance significantly affects economic growth for emerging/developing countries.

3. Methodology

Panel data analysis is used to validate/reject the hypothesis. Data are collected from 2008–2015 for 20 countries (see appendix A for the list of countries), 10 from each economic level as per Sigma

Table 1. Studies on insurance and economic growth

Author(s)	Scope	Statistical test	Focus and time	Result
Ward and Zurbruegg (2000)	Nine OECD countries	Granger causality test	Life/non-life Insurance 1961–1996	They concluded that impact of insurance industry varies on economic growth based on different economic levels
Webb et al. (2002)	55 Countries	Cross-section analysis	Life/non-life insurance 1980–1996	Banking and insurance sector has a positive effect on economic growth; the result is stronger than the effects obtained independently from each other
Hwang (2003)	China	Multiple regression models	Life insurance 1986–1996	Author concludes that economic reforms, social structure and higher education are the main factors for increased demand for life insurance in China
Kugler and Ofoghi (2005)	UK	Co-integration	Life and non-life at disaggregate 1971–1997	Authors found that insurance industry plays significant positive role in promoting economic growth and there exist bilateral relationship between economic growth and insurance
Boon (2005)	Singapore	Granger causality	Bank, stock markets and insurance 1987–2002	The author concluded that insurance coupled with stock market promotes economic growth. On the other hand, there is a demand (enterprise side) following pattern for banks and economic growth
Arena (2008)	55 countries	GMM on panel data	Life and non-life 1974–2004	Both the Life and non-life insurance significantly affects economic growth. However, life insurance affects economic growth in high-income countries while non-life insurance affects economic growth in both low-income and high-income countries as well
Tong (2008)	US, Sweden, Germany and South Korea	OLS, fixed effect and simulation equation	Life and non-Life	The author concluded that non-life insurance has a significant and positive effect on economic growth for all countries while life insurance has a positive and significant effect on the economic growth of the US and South Korea while it is negative for Germany and Sweden
Vadlamannati (2008)	India	Co-integration and causality test	Aggregate	Insurance sector reforms positively affect economic growth and financial intermediation services are an important part of the insurance industry
Adams, Andersson, Andersson, and Lindmark (2009)	Sweden	Causality test	Aggregate 1830–1998	The author concluded that bank credit facility promotes economic growth and demand for insurance while insurance sector has a positive effect on economic growth only in the boom periods
Du (2009)	China	Pooled OLS, random effects GLS and fixed effect	Health insurance 1991–2000	They found that open door policy coupled with deregulation are the main factors for decreased demand of health insurance in China
Njegomir and Stojić (2010)	Ex-Yugoslavia region	Specific fixed effect	Aggregate 2004–2008	The authors concluded that insurance positively affects economic growth as a risk transfer, indemnification and as institutional investor
Ching et al. (2010)	Malaysia	VECM and granger causality	Life insur-ance1997–2008	They concluded that there exist significant relationship between life insurance and Economic Growth for Malaysia
Kjosevski (2011)	Macedonia	Multiple regression	Aggregate 1995–2000	The author found a positive and significant effect of aggregate and non-life insurance on economic growth while the relationship was negative for the life insurance
Horng et al. (2012)	Taiwan	Vector autoregressive	Aggregate 1961–2006	Insurance demand and financial development Granger cause economic growth
Omoke (2012)	Nigeria	Co-integration	Aggregate 1970–2008	The author concluded that no relationship exists between insurance and economic growth for Nigeria.
Guochen and Chiwei (2012)	China (cross-regional study)	Bootstrap panel Granger causality	Life and non-life insurance 2006–2011	They conclude that demand following pattern is observed in the high-income provinces while supply following pattern is present in many provinces
Verma and Bala (2013)	India	OLS	Life insurance 1990–2011	They concluded that life insurance significantly affects the economic growth of India
Adams, Andersson, Hardwick, and Lindmark (2013)	Sweden	GMM	Life Insurance 1855–1947	Authors indicate that smaller firms outer perform than the larger firms in term of growth

(Continued)

Table 1. (*Continued*)

Author(s)	Scope	Statistical test	Focus and time	Result
Din, Mughal, and Farooq (2013)	Pakistan	ARDL/VECM/Granger Causality	Non-life and marine insurance 1982–2009	They found that marine insurance significantly affects international trade but the relationship is negative. While non-life insurance positively affects economic growth
Chau et al. (2013)	Malaysia	VECM Granger Causality	Life and non-Life insurance 1970–2012	They found that Life insurance in the short run has significant positive effect on economic growth while non-life insurance has positive effect in the long run
Ghosh (2013)	India	VECM	Life insurance	The author found that there exist long-term positive relationship between life insurance industry and economic growth. Furthermore, life insurance Granger causes the economic growth only
Kamiya (2013)	China	Report	Non-Life	The author identifies that unrestricted urbanisation coupled with the strong financial system are vital factors for the demand of non-life insurance. On the other hand, poor claim management, higher insurance cost and a lower variety of insurance product line are responsible for poor performance of insurance industry in China
Cristea et al. (2014)	Romania	Correlation	Life and non-life insurance 1997–2012	They concluded that life insurance, in the case of Romania, is more significantly affecting the GDP per capita than the non-life insurance
Akinlo and Apanisile (2014)	sub-Saharan Africa	Pooled OLS, GMM and Fixed Effect	Aggregate 1986–2011	They found that there exists a significant positive relationship between the insurance industry and economic growth for sub-Saharan Africa
Madukwe and Anyanwaokoro (2014)	Nigeria	Pearson's product movement Correlation coefficient	Life insurance 2000–2011	Author found there is positive and significant causal relationship between insurance and economic growth for Nigeria
Ghimire (2014)	Nepal	Conceptual	Aggregate	Based on the literature, author argued that insurance is promoting economic growth in Nepal via trade, investment and entrepreneurial activities
Alhassan (2016)	Sub African	ARDL and Causality	1990–2010	The author found a bi-directional relationship between insurance and economic growth. In addition, results of ARDL model revealed that life insurance has more significant and long-term effect on economic growth as compared to non-life insurance
Din et al. (2017)	USA, UK, China, India, Malaysia and Pakistan	PMG/ARDL	1980–2015	Authors found a significant relationship between aggregate insurance and economic growth for all countries. Similarly, results highlight a positive and significant relationship between non-life insurance and economic growth for all countries. However, a significant but a negative relationship was found between insurance and economic growth for USA, Malaysia and China
Hou and Cheng (2017)	31 countries	GMM and pooled mean group (PMG)	198–2008	The author found that banking sector has a significant relationship with economic growth while insurance and stock market were not much significant for many countries. In addition, authors also found that different financial institutions play a vital role in economic growth for countries based on income level and financial development of countries

Swiss-Re (2016) classification, to test the hypothesis. These countries are selected based on their world's GDP share, insurance density/penetration rate and their strategic importance. Previous studies such as Afza and Asghar (2010), Chang, Lee, and Chang (2013), Chau et al. (2013), Ghosh (2013), Tong (2008) and Verma and Bala (2013) used a proxy of net annual premiums to measure insurance activity while other researchers such as Kjosevski (2011) and Akinlo and Apanisile (2014) used either insurance penetration or insurance density as a proxy for the insurance industry. Due to different proxy measure, authors found mixed results, for example, Zouhaier (2014) used penetration as a proxy of insurance and found a negative relationship between insurance and economic growth. Whereas the study of Arena (2008) used insurance density as a proxy for insurance activity and the results were positive and significant. As a result, this study utilised three most important proxies for

Table 2. Econometric methodology

Variable	Proxy	Operational definition	Data source
Insurance Activity	Net Insurance Premiums	Total Net insurance premiums paid by all the policyholders during a given year	Sigma Re/Statistical bureau/Insurance association reports/Association of British insurers
	Penetration	Total Net insurance premiums paid by all the policyholders during a given year as a percentage of GDP	
	Density	Ratio of total insurance premiums in a given year to total population	
Economic growth	GDP in percentage	Change in total output produced in an economy	World Development Indicators (WDI)/International monetary fund/Global economy
Trade openness	Trade openness as percentage of GDP	A ratio of imports plus exports to GDP	WDI/International monetary fund/Global economy
Investment	Foreign direct investment in percentage	A ratio of FDI to GDP	WDI/International monetary finance/Global economy
Stock market	Stock market development in percentage	A ratio of stock market capitalisation to GDP	KSE/NSE/SSE/KLSE/LSE/NYSE and WDI
Banking sector	Banking sector	A ratio of domestic bank credit to GDP	Respective state/Central bank's statistical reports, and WDI/International monetary fund/Global economy
	Development		
	In percentage		
Labour force	Employment level	Number of persons unemployed in an economy	Respective state/Central bank's statistical reports, and world bank's statistics

Source: Din et al. (2017).

insurance such as net written premiums, penetration and density to test the hypothesis. In addition, none of the studies except Arena (2008) and Din et al. (2017) that explored the relationship between insurance and economic growth consider banking sector and the stock market as a significant controlled variable (Table 2).

$$Yit = \beta o + \beta_1 xit + \mu i + \varepsilon it$$

The choice of any statistical method depends on the value of μi.

$$\varepsilon\left(\mu i\right) \neq 0$$

$$Cov\left(\mu i,\ xit\right) \neq 0$$

The model specification is as follows:

$$GDP_{it} = \alpha + \beta_2\, LINSP_{it} + \beta_3\, NLINSP_{it} + \beta_4\, TO_{it} + \beta_5\, INV_{it} + \beta_6\, BD_{it} + \beta_7\, SMD_{it} + \beta_8\, EM_{it} + \mu$$

where, GDPit = Real Gross Domestic Product; $LINSP_{it}$ = Life Insurance; $NLINSP_{it}$ = Non-life Insurance; TO_{it} = Trade Openness; INV_{it} = Investments; BD = Banking Development; SMD = Stock Market Development; EM = Employment Rate.

Based on the nature and characteristics of data, fixed/random effect model is used *see* Din et al. (2017) for further details.

Table 3. Fixed/random effect model

Variables	Developed			Emerging/developing		
	Net written premiums	Penetration	Density	Net written premiums	Penetration	Density
Life insurance	0.70*	0.28	0.10*	−0.19	0.41**	0.00
Non-life insurance	−0.02	−0.01	0.05**	0.43**	0.13*	0.01*
Trade openness	0.124*	0.08*	0.09*	0.04	0.03	0.05*
Banking development	−0.04*	−0.04*	−0.04*	−0.13*	−0.11	−0.04*
Stock market development	0.35*	0.021*	0.02*	0.04*	0.03*	−0.01*
Investment	−0.22	0.05**	0.05**	0.66*	0.54*	0.02*
Employment	0.17*	−0.22	−0.23	0.83*	0.98*	0.02*
R^2	0.65	0.64	0.67	0.56	0.59	0.77
F-Statistics	2.84	2.53	2.70	6.65	6.67	1.72
Prob	0.00	0.00	0.00	0.00	0.00	0.00
Hausman test						
χ^2	13.52*	14.67*	12.78*	10.70*	29.94*	17.10*

*Represents significance at 5%, respectively.

**Represents significance at 10%, respectively.

4. Results and discussion

The results of fixed/random effect model are presented in the Table 3.

Table 3 presents the results obtained from the Hausman test, based on Statistics, we can reject the null hypothesis, that random effect is a suitable model for this data-set, as p-value is less than 0.05%. Concurrently, the results of fixed effect model are presented. Insurance is measured using three different proxies such as net written premiums, penetration rate and density. The results revealed that life insurance when measured with net written and density is significantly affecting economic growth for developed countries. However, the impact for net written premium is much stronger as the value of the coefficient is 8.70 as compared to 0.10 for density. Comparing the results of this study with studies of Soo (1996); Ward and Zurbruegg (2000); Webb, Grace, and Skipper(2002); Kugler and Ofoghi (2005); Boon (2005); Liedtke (2007); Arena (2008); Haiss and Sümegi (2008); Kozarevic, Ragen, and Gibbons (2008); Tong (2008); Ćurak et al. (2009); Han et al. (2010); Ching et al. (2010); Njegomir and Stojić (2010); Ege and Bahadır (2011); Chen, Lee, and Lee (2012); Akinlo and Apanisile (2014); Cristea et al. (2014), Madukwe and Anyanwaokoro (2014) and *theory of static risk and insurance* confirm that insurance promotes economic growth.

This result is in accordance with findings of Arena (2008), Alhassan (2016), Ouedraogo, Guerineau, and Sawadogo (2016) and Tong (2008) they also found that insurance, particularly life insurance, significantly affects economic growth for high-income countries. According to results, one unit deviation in net written premiums and density, holding other things constant, would generate a change of around 0.70 and 0.10% in economic growth, respectively. One possible justification for the significant role of life insurance in developed economies could be attributed to their higher gross domestic product and economic stability. A higher GDP per capita would increase the insurance spending. The significant relationship of life insurance and economic growth could also be explained by the long-term nature of life insurance's fund's availability and channelising these funds for technological advancement and institutional development. On the other hand, an insignificant relationship is found when penetration measure is used as a proxy for the insurance industry. This result is in-line with the study of Alhassan and Fiador (2014), Hadhek (2014), and Webb et al. (2002). These studies also found an

insignificant relationship for life insurance, when measured through penetration and economic growth. Perhaps, a possible justification for this insignificant result is the size of developed countries economies. As the proxy penetration is a ratio of net insurance premiums to GDP, a very high GDP value might suppress the penetration rate and that might not provide a statistically significant result.

In addition, results highlighted that non-life insurance is statistically significant when measured through density for developed countries. The result is consistent with the findings of Avram, Nguyen, and Skully (2010), Chang et al. (2014), Focarelli (2017), Kjosevski (2011), Lee, Lin, and Zeng (2016) and Tong (2008). However, an insignificant relationship is observed between non-life insurance and economic growth when net written premium and penetration is used as a proxy for the insurance industry. Authors like Catalan, Impavido, and Musalem (2000), Tong (2008), Umoren and Joseph (2016) and Ward and Zurbruegg (2000) also found an insignificant relationship between non-life insurance and economic growth using net written premiums and penetration proxy. The reason for this insignificant result might be that insurance is already reached at saturation stage in the developed economy and it is making a marginal contribution to these economies that is negligible. High insurance penetration is because of structural changes in the economy, resultantly, they are not playing a significant role in the economy. Another possible justification could be that high-income level leads towards risk taking behaviour, therefore, individuals don't shift their risk to someone else rather retain themselves. Lastly, as non-life insurance is comprised of four main products namely motor, fire, MAT and miscellaneous. Motor insurers are facing problems like morale (increased number of accidents, poor anti-thefts measures) and moral (manipulation in repair/health cost) hazard, and higher claims are some of them. While in case of MAT, poor underwriting expertise, freedom to choose international insurers and inadequate statistics are the main reasons for the insignificant contribution of non-life insurance into economic growth.

Moreover, results revealed a statistically significant relationship between non-life insurance and economic growth for all three proxies. The coefficient value pointed that the role of non-life insurance in economic growth for developing countries is much stronger than developed. This result is in line with the findings of Arena (2008), Ćurak et al. (2009), Han et al. (2010) and Outreville (1990). Unavailability, cost or lack of trust on other risk hedging institutions could be a possible reason for this significant relationship between non-life insurance and economic growth for emerging/developing countries. This significant relationship perhaps is due to squeezed per capita income in these countries making them more risk averse as compared to developed countries. On the other hand, a significant relationship between life insurance and economic growth is only found for emerging/developing countries when the insurance industry is measured through penetration at 10% significance level. Authors like Arena (2008) and Han et al. (2010) also found a significant relationship between life insurance and economic growth for developing countries. However, the same relationship is insignificant when the insurance industry is measured through net written premiums and density. The author claimed that a strong banking sector (saving substitute and investment channel) could be the possible reason for the negative relationship between life insurance and economic growth. The insignificant relationship could also be explained with reference to population, as most of the countries in emerging/developing list are most populated such as India, China, Pakistan and Indonesia, therefore, density (per capita insurance) might not have a significant impact on economic growth of developing countries.

As far as, control variables are concerned, trade openness is positively and significantly impacting the economic growth of both, developed and developing countries. Similarly, banking development is also significantly impacting the economic growth of both, developed and developing countries, but the direction is negative. Moreover, the stock market development also shows a significant relationship with economic growth for all countries.

5. Conclusion

Insurance, being part of the financial system, perform six basic functions such as pooling of resources, facilitate capital transformation, efficient pricing, risk hedging, facilitate trade and

commerce, and acting as an agent to deal with the asymmetric information issues to improve the economic well-being. All of these six functions of insurance could be categorised under intermediation, risk transfer and indemnification. Insurance holds a prominent position among other financial institutions due to stability and indemnification features of insurance contracts. Insurance industry not only helps in the development of financial sector (competitive pricing and efficient allocation of funds) but it also promotes economic growth indirectly. However, the role of insurance varies for different economic levels and largely depends on the proxy used to measure insurance activity. This study is an attempt to explore the relationship between insurance and economic growth for a period of 2006–2015 for 20 countries using three distinct proxies.

On the basis of Hausman test, fixed effect model's results are presented. Results revealed that life insurance has positive and a significant relationship with economic growth for developed countries when measured through net written premiums and density while it is significant for developing countries when the insurance industry is measured through penetration proxy. Moreover, results also confirmed that non-life insurance plays more significant role in promoting economic growth for developing countries for all three proxies while it is significant for developed countries only when measured through density.

The findings of this study are particularly important for policy-makers that they need to consider insurance as a substitute for banking and stock market rather than a complementary industry. Furthermore, the findings of this study would help policy-makers to identify important aspects that could be considered in formulating financial regulations and legislations especially those related to insurance.

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Notes
1. Moral hazard leads to poor allocation and economic will operate below than the efficient level.
2. Higher supply of financial services will lead towards higher demand from customers.
3. Measured by insurance density.

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Appendix A.

List of countries

Developed	Transitional/emerging
USA	Brazil
UK	Russia
Japan	India
Canada	China
France	South Korea
Germany	Saudi Arab
Italy	Turkey
Australia	Indonesia
Spain	Malaysia
Netherlands	Pakistan