International Journal of Finance, Insurance and Risk Management
Volume X, Issue 1, 2020

pp. 57-98

Insurance Market Development, Financial Service Export and Economic Growth: Evidence from East African Countries

Submitted 10/10/19, 1st revision 05/12/19, 2nd revision 12/01/20, accepted 28/02/20

Dr. Fentaw Leykun[1]

Abstract:

Purpose: *This article examines the long-run causal relationship between both insurance development and insurance and financial service export, and economic growth in 8 East African countries over the period of 2000-2018.*
Design/Approach/Methodology: *Using the panel auto-regressive distributed lag (ARDL) and fixed effect (FE) estimation techniques, it finds a robust evidence for this relationship. Furthermore, this article tests and finds the complementarity relationship between both insurance and banking sector development, and insurance and human capital investment, especially for economies having well developed financial sector in relative terms.*
Findings: *The research evidence raises questions regarding the impact that both, the faster growth of insurance activity and financial service export would have a positive effect on economic growth.*
Practical Implications: *Insurance contributes to the economic growth in terms of promoting financial stability and reducing anxiety, substituting government security programs, facilitating trade and commerce, mobilizing savings, enabling efficient risk management, mitigating losses, fostering a more efficient capital allocation. Besides, insurance and financial service export, though buried in domestic real exports, is becoming a relevant issue of concern in the empirical research as to its contribution towards economic growth.*
Originality/Value: *There is no such a detailed study in the field in the region under study. The conclusions are different for countries with a stock exchange and without a stock exchange market.*

Keywords: *Insurance market, financial services, economic growth, East Africa.*

JEL Codes: *G22.*

Paper Type: *Research study.*

[1]*Bahir Dar University of Ethiopia, w.fentahun@gmail.com*

1. Introduction

Recently, in the year 2018, a decade after the 2007/08 financial crisis, the global macroeconomic environment revealed signs of stability, although uneven and fragile, and given regional variations, growth rates are gradually returning to pre-crisis averages. Even though economic growth recovered globally to an estimated rate of 3% in 2018, a number of challenges threaten persisted strengthening. Among others, for instance, in the first quarter of 2018, global debt reached a new high of USD 247 trillion (327% of GDP), while total debt in frontier markets increased by USD 2.8 trillion. As a result of policy responses to tackle the financial crises, debt levels increased globally, and continue to pose a risk to the financial system.

Moreover, high debt burdens have the potential to surge spill over risk, mainly in the case of maturities mismatch while looking for financing, increase liquidity risk, hinder the implementation of countercyclical policies and increase the non-financial sector's sensitivity to interest rate changes[2] (IMF, 2018; World Bank, 2019). In relative terms the market showed some scant acclimatization in 2018, slightly favourable macroeconomic climate and some upward trending rates have been observed due to the losses from natural catastrophes in the preceding year[3].

The global insurance market, as an integral part of the international financial environment, operates in a puzzling macroeconomic and financial environment as characterized by high inflation rates in some jurisdictions; low and negative short and long-term interest rates in many advanced economies; and occasional eruptions of financial market volatility[4]. Global insurers are suffering from unstable prices; for instance, global commercial insurance prices increased in quarter of 2018 for the third consecutive period, mainly as a result of increases in property, financial and professional lines. In the same year, the market was relatively stable with prices in the UK and Australia trending upwards whereas prices in Europe and Asia trend downwards.

As identified by the global insurance market report in 2017, the low-yield environment is found as the main threat to the stability of the global insurance market, predominantly for companies offering long-term guaranteed rates on their products by way of they are prone to asset liability mismatch risk. The year 2017 was the second costliest year, following 2005, in terms of high-profile natural catastrophes, especially in the Caribbean and North America, it was known as the

---

[2]*World Bank (2019): Global Economic Prospects – Darkening Skies, January 2019; Institute of International Finance (2018): Global Debt Monitor – July 2018, 9 July 2018; Institute of International Finance (2018): Debt in Frontier Markets: Growing Liabilities, 13 September 2018; International Monetary Fund (2018): Fiscal Monitor: Capitalizing on Good Times, April 2018; International Monetary Fund (2018): Global Financial Stability Report: A Decade after the Global Financial Crisis: Are We Safer?, October 2018.*

[3]*International Association of Insurance Supervisors (IAIS), 2019, www.iaisweb.org*

[4]*Bank for International Settlements (2018): Annual Economic Report, June 2018.*

year of hurricanes Katrina, Rita and Wilma. In the same year, these catastrophic events caused USD 337 billion in losses. These losses were the result of fewer but more severe disasters than in 2016; for example, the three largest hurricanes, Harvey, Irma and Maria, accounted for almost one third of the total, and severely, more than 55% of these losses were remain uninsured.

The growth of global non-life insurance premiums slowed, in real terms, to 2.8% in 2017 from 3.3% in 2016, reaching USD 2,234 billion, primarily due to lower growth in emerging markets, 6.1% in 2017 compared to 9.8% in 2016. Mainly, China and North America each contribute 1% to the real non-life premium growth. Inter alia, Motor insurance, especially for US market, leftovers the main determinant of growth in non-life insurance premiums.[5] In terms of profitability of non-life insurance, as reported by the Swiss Re Institute, the return on equity (ROE) declined to 5.1% in 2017 for the third consecutive year. The loss was mainly attached to the underwriting losses from natural catastrophes. Consequently, rates on property lines have increased in regions severely hit by hurricanes and earthquakes, though the large reinsurance and alternative efforts have counterbalanced the high losses from natural catastrophes.[6]

Unlike non-life insurance premiums, global life insurance premiums only grew by 0.5% in real terms to USD 2,657 billion in 2017, contributed primarily by emerging markets as to 14%, offset by a 2.7% decrease in advanced economies. According to Global Insurance Market Report (GIMAR) 2019,[7] the decrease in advanced markets attributed primarily to the elongated state of low interest rates, which, as a result, might have switched consumers away from traditional life insurance to other savings instruments. As per this report, due to the demand for unit-linked and traditional insurance products, china was the most driver of the strong growth in emerging markets and became the second largest life insurance market next to US.[8] In terms of profitability, the global life insurance market remains under pressure, results from competition with other non-insurance products and issuance of guaranteed insurance products.[9] In responding to market challenges, life insurers were responding differently via such approaches as; lowering guaranteed benefits, making them more flexible or even eliminating guaranteed benefits products from the market altogether. Simultaneously, life insurers have opportunities to provide a viable alternative to close the pension savings gap and cover the benefits that governments cannot grant. According to Sigma Swiss Re (2016), Africa's and sub-Saharan Africa's stock market contributes 5% and 0.5%, respectively, to world's total market. While

[5]*Swiss Re Institute (2018): Sigma No. 3/2018: World Insurance in 2017: Solid, but Mature Life Markets Weigh on Growth, 2018.*
[6]*Swiss Re Institute (2018): Sigma No. 4/2018: Profitability in Non-life Insurance: Mind the Gap, 2018.*
[7]*Global Insurance Market Report (GIMR) (2019).*
[8]*Swiss Re Institute: Sigma No. 3/2018, 2018.*
[9]*Swiss Re Institute (2018): Global Insurance Review 2017 and Outlook 2018/19, 2018.*

investment in insurance is getting increasing since 1950, growing on average at a rate of 10%, which is faster than the world's economic growth. However, comparatively, life insurance experienced 30% growth rate. As a whole, economic contribution of insurance is getting increased; 6.23% of world GDP, of which the contribution of developed economies ranges from 8.6 to 10.9% of total GDP, while developing countries contributing 2.1 to 3.8% to the world GDP.

Regarding the economic and intermediary functions of insurance market activities in general, it has been argued in the literature that Insurance market activity, in terms of both as financial intermediary, and as provider of risk transfer and indemnification, may promote economic growth via permitting different risks to be managed more efficiently Arena (2008), it can cause economic growth by channelizing the long-term savings for the productive purpose and providing a buffer in advance of the risk associated with any activity related to productivity, assets or life Ghosh (2013), 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, and Baker (2017), in his occasional paper, Skipper (1997) stated the economic contribution of insurance from various aspects as:

- promotes financial stability and reduces anxiety;
- substitutes for government security programs;
- facilitates trade and commerce;
- mobilizes savings;
- enables efficient risk management;
- encourages loss mitigation;
- fosters a more efficient capital allocation.

Insurance is of great importance to a modern society by making many economic activities possible in addition to its contributions to the economies in terms of its size, employment, managed assets, and so on (Hana, Lib, Moshirian and Tiana, 2010). This activity would encourage the accumulation of new capital and mobilize domestic savings into productive investments. In this context, the evidence mentioned above raises questions regarding the impact that the faster growth of insurance activity would have on economic growth (Arena, 2008; Ghosh, 2013; Din, Angappan, and Baker, 2017). Empirically, by identifying the macro-economic factors that promote the demand for life insurance, it would be possible to find out the factors actually work as a catalyst in promoting financial development and thereby economic growth (Ghosh, 2013; Hana, Lib, Moshirian and Tiana, 2010).

Thus far, empirical studies have mostly examined the impact of banks and stock markets on economic growth. Amongst the most prominent studies in this regard are the works of Levine and Beck (2004), King and Levine (1993a, 1993b), Levine, (1998, 1999), Beck *et al.* (2000), Levine *et al.* (2000), Rousseau and Wachtel (2000), Olufisayo and Enisan (2009). However, although, the potential contribution

of insurance services to economic growth have been recognized, the potential causal relationship between insurance market activity and economic growth is relatively less examined, especially in low income developing countries characterized by under developed financial system, Many stock exchanges across Africa are relatively new by international standards[10], particularly east African countries such as Ethiopia, South Sudan, Sudan, Eritrea and Somalia are found under the list of countries without stock exchanges (Arena, 2008; Han *et al.*, 2010). Most typically, Ethiopia has listed under the biggest notable country in the world with no stock exchange with a population of almost 100 million. On the other hand, it is home to Africa's first commodity exchange, the Ethiopia Commodity Exchange (ECX), which began operations in 2008.[11]

The aim of this study is to examine the causal relationship between insurance market activity, insurance and financial service export and economic growth in east African countries, distinguishing the particular effects of life and non-life insurance activity. That is, although, it has been recognized that insurance activity not only would have an effect on economic growth as provider of risk and indemnification but also as institutional investor by mobilizing savings, this article, due to data limitations in those low income developing countries with undeveloped financial system, examines the effects of insurance on economic growth solely as provider of risk and indemnification. The other concern of this article is to examine whether the measures of insurance activity (life and non-life) are complementary or not with the measures of banking sector and human capital investment to test whether banks, human capital and insurance companies/insurers complement each other.

2. Literature Review

2.1 Theoretical Literature Review

Theoretical literature on the potential complementary or substitution effect between financial development and economic growth has put forward since Schumpeter (1912). Since then, theoretical arguments have concentrated on how stock markets and banks in the financial system influence savings and investment decisions and hence long-run growth rates. According to Arena (2008) and Levine (2005) a financial system may accomplish this objective via playing the following roles: reducing costs of searching for potential investments; sustaining corporate governance; trading, diversifying, and managing risk; mobilizing and pooling savings; conducting exchanges of goods and services; and lowering the negative consequences of random shocks on capital investment. A number of financial

[10]*Stock exchanges in sub-Saharan Africa: capturing intent towards environmental, social and governance (ESG) requirements, © The Association of Chartered Certified Accountants July 2014.*

[11]*https://www.investmentfrontier.com/2014/07/28/list-countries-without-stock-exchanges/*

models emphasize that well-functioning Financial intermediaries and markets more bearable information and transaction costs and thereby hasten efficient resource allocation and hence faster long-run growth (King and Levine, 1993a; Beck and Levine, 2004; Enisan and Olufisayo, 2009; Rupeika-Apoga *et al.,* 2018), i.e., countries having well developed financial systems enjoy faster and more stable long-run growth, and such well-developed market have a substantial positive impact on total factor productivity, which transforms into higher long-run economic growth[12]. However, the positive effects of financial development are tailored by the macro policies, laws, regulations, financial infrastructures, and enforcement norms applied across countries and time (Arena, 2008; Thalassinos *et al.,* 2015).

Given extensive empirical studies on the causal relationship between financial development and economic growth, the debate in the literature remains hot as to the long-run association ship and the direction of causality, whether bidirectional causality exists, and yet, there is no a unified theoretical framework modelling among banks, stock markets and insurance activity. The debate has taken threefold; the supply leading argument, demand following argument and feedback hypothesis.

Proponents of the first argument suggested the importance of well-developed financial system in achieving high rates of economic growth. In this regard, the economic contributions of financial development can be explained in terms of efficient capital allocation, savings mobilization via providing attractive instruments and saving vehicles, providing of channels for trading, pooling and diversifying risk, lowering information gathering and processing costs and thereby improve resources allocation, and amplifying specialization in production, entrepreneurship development and adopting new technology. Precisely, the supply leading argument states that well-functioning financial system matters to mobilize limited resources from surplus to deficit area via promoting efficient allocation of resources and thereby lead other real economic sectors to growth (Goldsmith, 1969; McKinnon, 1973; Shaw, 1973; Enisan and Olufisayo, 2009; Gubin *et al.,* 2017).

On the contrary, as per the views of demand following argument, financial development is viewed as the server of economic development by reacting passively when financial services demanded by the growing economy. In short, economic growth in the real sector facilitates the development of the financial system, financial system reacts effectively to the demand created by the growing economy towards making arrangement of financial instruments, reacts as change comes from the real economic sector (Robinson, 1952; Romer, 1990; Stem, 1989).

Based on the level of economic development, feedback hypothesis proclaims that both financial development and economic growth have a positive

[12]*Haiss and Sümegi, K. (2006). The Relationship of Insurance and Economic Growth – A Theoretical and Empirical Analysis, European institute university of economics and business administration Vienna.*

interdependence/bidirectional/two-way relationship; i.e., in this regard, Schumpeter (1912) asserts that a country having well-developed financial system could promote high economic growth through innovative products, services and technology. In turn, this economic growth stimulates high demand for financial services (Levine, 1997; Luintel and Khan, 1999; Cristea and Thalassinos, 2016).

Pagano (1993) has captured the potential effects of financial development on economic growth by assuming a simple endogenous model, known as the 'AK' model, where aggregate output is a linear function of the aggregate capital stock: financial development affects growth via:

(1) Funnelling saving to firms-financial intermediaries absorb resources while transforming saving into investment, so that a dollar saved by households generates less than one dollar worth of investment, the remaining fraction goes to banks as the spread between lending and borrowing rates, and to securities brokers and dealers as commissions, fees and the like. This absorption of resources by the financial sector is primarily a reward for services supplied, but it may also reflect the X-inefficiency of the intermediaries and their market power.
(2) Improving the allocation of capital- as one of their key functions, financial intermediation allocate funds to those projects where the marginal product of capital is highest. i.e., intermediaries increase the productivity of capital and thereby promoting growth in two ways: (i) collecting information to evaluate alternative investment projects; and (ii) inducing individuals to invest in riskier but more productive technologies by providing risk sharing.
(3) Affecting the swing rate-by altering saving rates financial development can affect economic growth with ambiguous sign of relationship; that financial development may also reduce saving, and thereby growth. As capital markets develop, households gain better insurance against endowment shocks (such as health hazards) and better diversification of rate-of-return risk (such as that due to the volatility of stock returns), while consumer credit becomes more readily and cheaply available. Financial development also narrows the wedge between the interest rate paid by firms and that received by households.

Each of these factors affects saving behaviour, but in each case the effect is ambiguous. This author further argued that, given the first documentation of the positive correlation between growth and financial development indicators by Goldsmith (1969), McKinnon (1973) and Shaw (1973)[13], then after, however, two interpretative problems emerged, and still lie largely unresolved. On the one hand, does the causal relationship run from financial development to growth, the reverse, or both ways? On the other hand, given that financial development enhances growth,

[13]*Goldsmith (1969) argued that the correlation reflected a two-way causal relationship, and that financial markets enhance growth by raising the efficiency of investment. McKinnon (1973) and Shaw (1973) claimed instead that financial intermediation raises mainly the level of saving and investment.*

does it do so by enhancing the efficiency of investment or the rate of investment (the saving rate or the proportion of saving invested)?

The abovementioned argument has been tested empirically in a comprehensive study by King and Levine (1992) which confirms, especially in cross-country data, that growth correlates with many indicators of financial development; (i) the ratio of credit to GDP (a measure of total financial size), (ii) the ratio of deposit bank domestic assets to the sum of deposit bank and Central Bank domestic assets (the fraction of credit intermediated by deposit banks) and (iii) the ratio of claims on the non-financial private sector held by deposit banks and the Central Bank to total domestic credit (the fraction of credit extended to firms and households).

But still, the partial correlation remains apparent even after controlling for a host of 'core' variables such as the initial level of GDP, schooling, and measures of monetary, fiscal and trade performance. Thus, the findings in those prior literatures are found irresolute in terms of both on causality and on the relative importance of the efficiency and the rate of investment. Hence, Progress on causality will require resorting to policy variables that affect financial markets but are unaffected by growth (Roubini and Sala-I-Martin, 1991)[14]. Pagano (1993), King and Levine (1992), Goldsmith (1969) and McKinnon (1973) and Shaw (1973) conclude that most of the empirical studies have been using highly aggregated indicators of financial intermediation, inter alia, such as the ratio of M2 or private sector credit to GDP. The use of such combined indicators neglects one of the lessons of the theoretical literature, namely that the effect of financial development can vary depending on the specific market where it occurs: insurance and household credit may well reduce the growth rate, via reduced saving, whereas bank lending to companies or the creation of a stock market is more likely to promote growth. Hence, empirical studies should focus on specific indicators varying across different economies in cross-country studies, is the concern of this study too.

Particularly, regarding the insurance-growth nexus, various ways have been noted in the literature as to its independent or interaction effect on economic growth. Broadly, insurance markets, both as a provider of risk transfer and indemnification, and as an institutional investor, can contribute for the growth of a given economy in various ways. Inter alia, for instance, could facilitate growth via promoting financial stability, expedite trade and commerce, as the most ancient insurance activity, mobilize domestic savings, efficient risk management via the accumulation of new capital, foster a more efficient allocation of domestic capital, and helping to reduce or mitigate losses (Skipper, 1997; Arena, 2008; Han *et al.*, 2010), through issuing insurance policies they collect funds and transfer them to deficit economic units for financing real investment (Ćurak, Lončar and Poposki, 2009).

[14]*Who find that growth is negatively correlated with the bank reserve ratio? A proxy for financial repression that is unlikely to be affected by growth.*

On top of that, Webb *et al.* (2002) argued on the economic contribution of life and property/liability insurers from various aspects: life insurance can increase productivity by reducing the demand for liquidity and shifting limited resources from unproductive to more productive economic uses, similar to the role of banks on investment quality documented by Pagano (1993); property/liability insurers provide an extra risk-financing choice, which potentially reduces the probability of firm financial distress and firm bankruptcy costs, influences investment decisions in a particular economy; insurers may potentially increase expected investment returns by reducing the costs of risk financing, because insurers can: *''(a) Excel in offering risk-pooling services through the identification of standardized risks and simplification of contracts, (b) Provide optimal investments and asset-liability matching, (c) Provide valuable and cost-effective administrative services related to risk management and claims payments, and (d) Offer products that are tax-deductible business expenses in many markets''* (Webb *et al.*, 2002). In sum, financial intermediation can affect economic growth by acting on the saving rate, on the fraction of saving channelled to investment, or on the social marginal productivity of investment (Pagano, 1993).

Theoretical works concentrated on modelling the links among banks, stocks and economic growth[15]. However, to my knowledge, there no a unified framework modelling the link among banks, stocks and insurance activity (development) on one side and economic growth on the other side. Arena (2008) has tried to comprehensively examine the dynamics of these variables of interest among theme selves and their individual complementary or substitution effect on economic growth using the generalized method of moments panel estimation technique covering 55 developed and developing countries for the period 1981-2004 and concluded as to the positive and significant causal effect of both life and non-life insurance on economic growth. The finding asserts that insurance activity may contribute to reinforcing the process of resource allocation done by banks and capital markets (consistent with, Beck 2004; Enisan and Olufisayo, 2009). At the same time the development of the banking sector may reinforce the development of insurance activity via a much more effective payment system that allows an improved financial intermediation services, Arena (2008) and Han *et al.* (2010), further, its development provides liquidity facilities to insurance companies that enable them to pay their claims (Rule, 2001).

Insurance as a conjoint (positive) effect with the banking sector shields banks and their customers from risks that may eventually make customers able to pay their debts that might otherwise leave them unable. Particularly, property insurance may facilitate bank intermediation activity by partially collateralizing credit that would reduce banks' credit risk exposure and there by promoting higher levels of lending (Rule, 2001; Grace and Rebello, 1993; Zou and Adams, 2006).

[15]*See Beck and Levine (2004): stock markets, banks and growth: panel evidence.*

Concerning the conjoint effect with stock market, and capital markets in general, the development of insurance activity, particularly for life insurance companies, could promote stock and bond market development (capital market deepening), by investing funds (savings) raised via contractual saving products in stocks and equities (Catalan *et al.*, 2000; Skipper, 1997). On the other side, stock markets may reinforce developing insurance activities by maintaining liquid capital markets, i.e. the resources by insurance companies, captured by premium payments, can easily be invested in this liquid market. This is especially found important for life insurance companies to much their long term liabilities with long term assets, which are not normally available via banks). At the same time, as it is true for banks, there are inter-linkages between insurance companies and stock markets for the reasons of market and insurance risk transfer. Insurance companies can transfer both of these risks to capital markets in two ways; market risk by hedging of embedded options in life insurance portfolios and insurance risk related to natural catastrophes (catastrophe bonds). On the other side, capital markets may transfer market risk to insurance companies when insurance companies write options and buy bonds with embedded options (e.g., callable bond) (Rule, 2001; Grace and Rebello, 1993; Zou and Adams, 2006).

A potential negative complementarity between insurance activity, particularly life insurance and banks may be due to "saving substitution effect" that is because in the market for intermediated saving, insurance companies could compete and reduce banks' market share (Haiss and Sümegi, 2006; Allen and Santomero, 2001). However, insurers then may invest part of that saving in banks equities and regard debt as lesser importance, thus empirical evaluation is require knowing the magnitude of the final effect.

Due to the fact of risk transfer, the interdependency between banking and insurance activities has been increasing. Given their mutual exposure in many areas, banks are unbundling their credit risk to insurance providers mainly via both the securitization of credit portfolios (asset backed securities and collateralized debt obligations) and derivatives (credit default swamps). On the other hand, insurers are transferring credit risks to banks via liquidity facility and letter of credit (Rule, 2001). In addition, channelling of savings by insurance companies would not only develop the stock and bond markets but also foster more efficient capital allocation by gathering significant information to evaluate projects and firms in order to allocate the financial capital and interest risk bearings capacity (Rule, 2001). Besides, insurance is appealing potential investors since it is uncorrelated with other types of business activities.

In the light of the aforementioned arguments, since the objective of this article is to investigate the causal relationship between insurance sector development and economic growth in east African countries where there is no or small stock exchange markets, it will contribute new insights to the existing literature via examining the impact of insurance market activity on economic growth in the region.

2.2 Empirical Literature Review

Prior empirical studies focus on the relationship between aggregate insurance sector development and economic growth (Niegomir and Stojic, 2010; Kjosevski, 2011; Horng *et al.,* 2012; Omoke, 2012; Akinlo and Apanisile, 2014; Ghimire, 2014; Alhassaan, 2016; Din *et al.,* 2017) or financial sector development (banks, stock) and economic growth (Hou and Cheng, 2017; Admas, Andersson and Lindmark, 2009; Enisan and Olufisayo, 2009; Beck and Levine, 2004; Levine and Zervos, 1998; Adjasi and Biekpe, 2006; Shahbaz, Ahmed and Ali, 2008; Demirgüç-Kunt and Levine, 1996; Boon, 2005). Empirical studies reported five possible relationships that could exist between insurance activity and economic growth; supply leading (Goldsmith, 1969; McKinnon, 1973; Shaw, 1973; Enisan and Olufisayo, 2009; Ward and Zurbruegg, 2000), demand following (Robinson, 1952; Romer, 1990; Stem, 1989; Schumpeter, 1912; Levine, 1997; Luintel and Khan, 1999; Ching *et al.,* 2010), feedback/ interdependence (Levine, 1997; Luintel and Khan, 1999; Ghosh, 2013), negative (Zouhaier, 2014), and no relationship (Haiss and Sümegi, 2008; Omoke, 2012).

The causal relationship of insurance market activity and economic growth has not been extensively studied (Arena, 2008; Han *et al.,* 2010; Ul Din *et al.,* 2017). The empirical examination of causal relationship between insurance, (life and non-life), market development or activity have been assessed by scanty of papers. Inter alia, the work of Ward and Zurbruegg (2000), Webb *et al.* (2002). Kugler and Ofoghi (2005), Arena (2008). Tong (2008), Guochen and Chiwei (2012), Chau *et al.* (2013), Cristea *et al.* (2014), Han *et al.* (2010) and Ul Din *et al.* (2017) are found exceptional.

Arena (2008), Han *et al.* (2010) and UI Din *et al.* (2017) test the existence of causal relationship between insurance market activity (life + non-life), measured by insurance density, and economic growth, and finds that both life and non-life insurance have positive and significant causal effect on economic growth. Using the generalized method of moments (GMM) covering 55 countries (developed and developing) between 1974 and 2004, Arena (2008) finds robust evidence that both life and non-life insurance have a positive causal effect on economic growth. The author further points out that, for life insurance, high income countries drive the results, and for non-life insurance, both countries drive the results. Han *et al.* (2010) investigated the causal relationship between insurance development, (measured by insurance density), and economic growth, (measured by real per capita GDP growth), by employing GMM models on panel data set covering 77 countries (developed + developing) for the period 1994-2005, and finds, by controlling a simple conditioning information set and a policy information set, that insurance density is positively correlated with economic growth.

By dividing the sample in to developing and developed economies, the authors further points out that the overall insurance development (life + non-life) play a

much more important role than they do for the developed economies. Recently, Han *et al.* (2017) examines the causal relationship between insurance and economic growth by employing fixed effect panel data model covering 20 countries for the period 2006-2015. The authors measured insurance market activity comprehensively, alike most prior empirical studies, using the three distinctive proxies such as insurance net written premiums, insurance penetration and insurance density. While measuring insurance market activity using net written premiums and density, the study found a positive and significant relationship between life insurance and economic growth for both economies. The study has also revealed a statistical significant relationship between non-life insurance, for all three proxies, and economic growth for developing countries, however, for developed countries the results are found only significant when insurance density is used as proxy. Further, the study point out that non-life insurance plays a more significant role for developing economies as compared to developed ones.

In the light of literature, for the significant role of life insurance in developed economies, one possible justification could be attributed to their higher GDP and economic stability (UI Din *et al.,* 2017). A higher GDP per capita would increase insurance spending. According to these authors, this significant relationship could also be explained by the long-term nature of life insurance's fund's availability and channelizing these funds for institutional development and technological advancement. On the other hand, the possible explanation given for an insignificant relationship between insurance and economic growth when insurance market activity is measured by penetration, is that the size of developed economies. That is, a very high GDP might supress the penetration rate and that might not provide a statistical significant result, since the insurance penetration proxy is the ratio of net insurance premiums to GDP. Besides, an insignificant relationship is revealed between insurance and economic growth when net written premiums and penetration are used to proxy insurance. The reason for this result might be that insurance has already reached at saturated stage in the developed economies and making a marginal contribution that is negligible to the economy (Ward and Zurbruegg, 2000; Tong, 2009; UI Din *et al.*, 2017). On top of that, high income level leads towards risk taking behaviour and there for individuals do not shift their risk to someone else, instead they themselves retain them.

UI Din *et al.* (2017) further justifies the insignificant relationship of non-life insurance and economic growth that non-life insurance is comprised of four main products; motor, fire, MAT and miscellaneous. Motor insurers are facing morale, increased number of accident, poor anti-theft measures, and moral, manipulation in repair or health cost, hazards. Poor underwriting expertise, freedom to choose international insurers and in adequate statistics are mentioned, in case of MAT, as the reason for the insignificant relationship between non-life insurance and economic growth. Furthermore, the justification given for the statistical significance relationship between non-life insurance (using all three proxies) and economic growth in developing countries is attributed to unavailability, cost or lack of trust on

other risk hedging institutions, and this result also might be due to squeezed per capita income in these economies making them risk averse as compared to developed economies (Arena, 2008; Ćurak *et al.,* 2009; Han *et al.,* 2010; UI Din *et al.,* 2017). Moreover, Arena (2008), Han *et al.* (2010) and UI Din *et al.* (2017) have found a significant relationship between life insurance and economic development, only for emerging/developing countries, when insurance industry is measured via penetration. However, when insurance industry is measured via net written premiums and density, the same relationship is found insignificant. The insignificant relationship has also been explained with reference to population size, since developing/ emerging countries are most populated, density (i.e., per capita insurance) might not have significant role on developing countries economic growth.

The authors attribute, the justification for the negative relationship between life insurance and economic growth, to a strong banking sectors (saving substitute and investment channel). From the empirical evidences reviewed so far, the causal relationship between aggregated and disaggregated insurance activity and economic growth ends up with inconclusive results that might be emanated from the various levels of economies, data estimation techniques and proxies, such as real written insurance premium, penetration and density, to capture the insurance industry activity/ development.

Handfuls of works partially examined the causal relationship between insurance and economic growth in different economies. Hawang (2003), Ching *et al.* (2010), Verma and Bala (2013), Admas *et al.* (2013), Ghosh (2013) investigated the causal relationship between life insurance and economics growth. Hawang (2003) examined factors affecting the demand for life insurance in China by employing multiple regressions and concludes that economic reform, social structure and higher education are the main factors contributing for the demand for life insurance in China. Using Vector Error Correction Model (VECM) and Granger Causality, Ching *et al.* (2010) finds a significant relationship between life insurance and economic growth in Malaysia. Verma and Bala (2013), by using, Ordinary Least Square (OLS) estimation technique examined the causal relationship between life insurance and economic growth in India and concludes that life insurance as a significant driver of economic growth in the country. In the same country, Ghosh (2013) examined, via employing VECM, the issue and revealed the long-term positive relationship between life insurance industry and economic growth, and the author further asserts that only life insurance Granger causes economic growth. Meanwhile, Madukwe and Anyanwaokoro (2014) examined the same issue in Nigeria by applying Pearson's product movement production coefficient and arrive at a positive and significant causal relationship between the variables of interest. While Admas *et al.* (2013) points out, by employing GMM, in terms of growth that smaller firms outperform than large firms in Sweden. One could infer from the aforementioned empirical evidence that, regardless of the level of economies and estimation models employed, there exists a positive and significant causal relationship between life insurance and economic growth.

Based on the existing literature reviewed here above, the following hypotheses could be formulated:

H1: Life insurance significantly affects economic growth for east African countries.
H2: Life insurance significantly affects economic growth for east African countries with no capital stocks.
H3: Non-life insurance significantly affects economic growth for east African countries.
H4: Non-life insurance significantly affects economic growth for east African countries with no capital stocks.
H5: The interaction between insurance and banking development significantly affect economic growth for east African countries.
H6: The interaction between insurance and human capital significantly affect economic growth for east African countries.

3. Methodology

Various statistical models/data estimation techniques could be justified to examine the causal relationship between insurance market activity and economic growth based on the nature of the variables in the study and on whether the study is a cross-country or a single country. Most of single country studies employed ARDL/VERM/Granger causality/co-integration estimation techniques to deal with the causal relationship between insurance and economic growth (Kungler and Ofoghi, 2005; Boon, 2005; Ul Din *et al.,* 2017; Ghosh, 2013; Chau *et al.,* 2013). Whereas cross-country studies examined the issue using the various panel data estimation techniques; GMM, Granger causality, pooled OLS, fixed effect, random effect GLS, pooled mean group (PMG)/ARDL.

Although most cross-country studies employed dynamic models, such as differenced or system GMM estimation methods, to deal with unobserved time effects, through the inclusion of period specific intercepts, and to deal with endogeneity and simultaneity issues, this article may use either of the static/rudimentary panel data estimation methods, such as Pooled OLS, fixed effect or random effect, due to the fact that the data set may not fulfil the precondition that the number of cross-sections should exceed the number of periods to employ dynamic GMM techniques.

Panel data analysis in general is found more appropriate for various reasons: accounts for large sample size, considers heterogeneity for individual specific variable, less colinearity, high speed of adjustment, mire variability, high level of freedom and efficiency than time-series or cross-sectional data (Guajarati, 2003; Baltagi, 2005).

Following Webb *et al.* (2002) and Arena (2008), the general GMM regression equation looks as follows:

$$yi,t = \alpha + \beta' Xi,t + \mu t + \eta i + \varepsilon i, \quad (1)$$

where: i,t, respectively, represents country and time period; y is the dependent variable economic growth, X is a set of explanatory variables varying across time and country, various proxies for banking, stock market and insurance development, interaction terms and control variables; β' is the vector of coefficients to be estimated; μt is unobserved time specific effect; ηi is unobserved country specific effect; and ε is the error term.

This article aims to comprehensively examine the causal relationship between insurance market activity, insurance and financial service exports and economic growth by using insurance penetration as proxy of insurance, (i.e., life, non-life and total insurance penetration), following previous studies by Arena (2008), Din *et al.* (2017) and Din *et al.* (2017). This article also incorporates significant control variables in the model. None of the studies so far control for the effect of banking sector and stock markets except Arena (2008), Din *et al.* (2017) and UI Din *et al.* (2013).

As in UI Din and Regupathi (2017) and UI Din *et al.* (2017), this article evaluates the effect of insurance market activity on economic growth within the context of standard growth regression specification. Accordingly, based on the nature of the data and the objective of the study, fixed effect and panel autoregressive distributed lagged (PMG/ ARDL) panel estimation techniques are employed. The difference and the choice of panel data models depend on the three components of the error term (individual effect-unobserved country specific effect, time variant effect-unobserved time specific effect, and the reminder that could be correlated with the error term), as specified bellow. Consider the multiple linear regression model for individual i = 1..., N who is observed at several time periods t = 1, ..., T:

$$yit = \alpha + x'it\beta + z'\gamma + ci + uit \quad (2)$$

where: yit is the dependent variable; $x'it$ is a K-dimensional row vector of time-varying explanatory variables; $z'$is a M-dimensional row vector of time-invariant explanatory variables excluding the constant; α is the intercept; β is a K-dimensional column vector of parameters; γ is a M-dimensional column vector of parameters; ci is an individual-specific effect; uit is an idiosyncratic error term.

The idiosyncratic error term uit is assumed uncorrelated with the explanatory variables of all past, current and future time periods of the same individual. This is a strong assumption which rules out lagged dependent variables. Here, in the general econometrics model specification, the data generation process is described by linearity in parameters α, β, γ, effect ci and error uit; independence ({Xi , zi , yi} N

i=1,….N, i.i.d. (independent and identically distributed); strict exogeneity E[uit|Xi, zi, ci] = 0 (mean independent); error variance (homoscedastic and no serial correlation).

The model specification above in equations 1 and 2 could not be appropriate for this article because to use GMM (#1) the cross section should exceed the periods, and the Pooled OLS, also known as common constant method (parameter α represents constant, if the intercept and slope coefficients (α,β) are without subscript that means they will be the same for all cross-sectional units and for all periods), may not be appropriate because the intercept α and the slope β are allowed to be specified with subscripts to account for the panel structure of the data and relax the assumptions and allow some degree of heterogeneity for α, i.e., αi instead of α.

4. The Econometric Regression Model Specifications

This paper adapted Autoregressive-Distributed Lag (ARDL) estimation technique. The autoregressive distributed lag (ARDL) model is being used for decades to model the relationship between (economic) variables in a single-equation time-series setup, but in more recent times they have been shown to provide a very valuable vehicle for testing for the presence of long-run relationships between economic time-series such as GDP growth (Kripfganz and Schneider, 2016).[16] Its popularity also stems from the fact that co-integration of non-stationary variables is equivalent to an error-correction (EC) process, and the ARDL model has a re-parameterization in EC form (Engle and Granger, 1987; Hassler and Wolters, 2006). The existence of a long-run / co-integrating relationship can be tested based on the EC representation. A bound testing procedure is available to draw conclusive inference without knowing whether the variables are integrated of order zero or one, I(0) or I(1), respectively (Pesaran, Shin and Smith, 2001). Besides, following Arena (2008) and UI Din *et al.* (2017), the fixed effect estimation was employed to examine the linear effects of insurance market activity, interaction term between each insurance variable (life, non-life, and total) and private credit to GDP, and between human capital and insurance variables.

4.1 Estimating Long-Run Relationships

Engle and Granger (1987) have developed a two-step approach for testing the existence of a long-run relationship with the assumption that $(Yt, Xt)'$ is a vector of *I* (1) variables. Let's see how run an OLS regression, in the Engle and Granger approach, for the model in levels biases estimation results:

$\boldsymbol{Yt = b0 + \theta' Xt + Vt}$, and test whether the residuals $\hat{v}t = Yt - \hat{b}0 - \boldsymbol{\theta'} xt$ are stationary (e.g. with a Dickey-Fuller test). Estimate an EC model with the lagged residuals from the first step included as EC term (provided they are stationary):

[16] *Stata Conference Chicago, July 29, 2016.*

$\Delta yt = c_0 + \gamma \hat{V}t - 1 + \sum_{i=1}^{p-1} \varphi yi \Delta yt - i + \sum_{i=0}^{q-1} \Psi xi \Delta xt - i + ut,$
and test whether $-1 \leq y < 0$ (3)

The disadvantages of the Engle and Granger (1987) approach is that the order of integration of the variables needs to be determined first, OLS estimation of the static levels model may create bias in finite samples due to the omitted short-run dynamics (Banerjee, Dolado, Hendry, and Smith, 1986), the bias from the first step transmits to poor second-step estimates, the asymptotic distribution of the OLS estimator for the long-run parameters is non-normal, invalidating standard inference based on the *t*-statistic, and the general pretesting problems: misclassification of variables as *I* (0) or *I*(1); false positives and false negatives at the first step.[17] Thus, this paper tends to apply the ARDL model to overcome these problems and to see the short-term and long-term relationship by estimate the error correction term, the long-run parameters and the short-run dynamic coefficients.[18] The basic ARDL model specification, $ARDL\ (p, q \ldots., q)$ model is presented in eqution (4):

$$yt = c0 + c1t = \sum_{i=1}^{p} \emptyset iyt - i + \sum_{i=0}^{q} \beta' \mathrm{xt} - \mathrm{i} + \mathrm{ut} \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots . . (4)$$

Where, $t = max(p, q), \ldots, T,$ for simplicity assuming that the lag order q is the same for all variables in the $Kx1$ vector xtxt. The variables in $(yt, x't)'$ are allowed to be purely *I* (0), purely *I* (1), or co-integrated. The optimal lag orders *p* and *q* (possibly different across regressors) can be obtained my minimizing a model selection criterion, e.g. the Akaike information criterion (AIC) or the Bayesian information criterion (BIC).[19] The error correction (EC) representation model could be specified as bellow, re-parameterization in conditional EC form:

$$\Delta yt = c0 + c1t - \alpha(yt_1 - \boldsymbol{\theta x t_1}) + \sum_{i=1}^{p-1} \varphi yi \vartriangle Yt_1 + \omega' \vartriangle Xt + \sum_{i=1}^{q-1} \varphi xi \Delta \boldsymbol{Xt}_i + ut$$

with the speed-of-adjustment coefficient $\alpha = 1 - \sum_{j=1}^{p} \emptyset i$ and the long-run coefficients $\theta = \frac{\sum_{j=o}^{q} \beta j}{\alpha} \ldots (5)$

---

[17]*Phillips and Hansen (1990) proposed the fully-modified OLS estimator to overcome some of these problems.*
[18]*Pesaran and Shin (1998) suggest to obtain the long-run parameters from an ARDL model*
[19]*The BIC is also known as the Schwarz or Schwarz-Bayesian information criterion.*

Alternatively error correction model can be parameterised as follows:

$$\Delta Yt = c0 + c1t - \alpha(Yt_1 - \theta Xt) + \sum_{i=1}^{p-1} \varphi yi\Delta Yt_i + \sum_{i=0}^{q-1} \varphi' Xi\Delta Xt_i + ut \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (6)$$

Finally, the re-parameterized ARDL $(p, q, q, q \dots., q)$panel error correction model (ECM) is specified:

$$\boldsymbol{\Delta Yit = \theta i[Yi, t_1 - \lambda' iXi, t] + \sum_{j=1}^{p-1} \varphi ij\Delta Yi, t_j + \sum_{j=0}^{q-1} \beta' ij\Delta Xi, t_j + \partial + uit \dots\dots\dots\dots\dots\dots\dots\dots\dots (7)}$$

Where: yit is the dependent variable; (X'it)' is a kx1 vector that are allowed to be purely $I(0)$ or I(1) or co-integrated; φ is the coefficient of the lag dependent variable; $\beta' ij$ is a kx1 coefficient vector; ∂ is the unit specific fixed effect; θi= -1(1- σ), group specific speed of adjustment coefficient (expected that θi<0); $\lambda' \mathrm{i} = \text{vector of long run relationship}$; the error correction term (ECT) = $[\mathrm{Yi}, \mathrm{t}_1 - \lambda' \mathrm{iXi}, \mathrm{t}]$, $\varphi \mathrm{ij}, \beta' \mathrm{ij}$ are the short run dynamic coefficients; i=1-N, t= 1,2…,T; p-1 and q-1 are the number of lags for the dependent and explanatory variables respectively; uit is the error term.

$$\boldsymbol{\Delta GDPgri, t = \theta i[Yi, t_1 - \lambda' iXi, t] + \sum_{j=1}^{p-1} \varphi ij\Delta GDPgri, t_j + \sum_{j=0}^{q-1} \beta' ij\Delta Xi, t_j + \partial + uit \dots\dots\dots\dots (8)}$$

where, GDPgr stands for gross domestic product per capita growth rate.

4.2 The Basic Fixed Effect (FE) Model Specification

The fixed effect model is presented in equation (9) as follows:

$$\boldsymbol{yit = \alpha i + X' it\beta + uit \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (9)}$$

Where: αi are individual intercepts (fixed for given N). No overall intercept is (usually) included in the model. Under FE, consistency does not require, that the individual intercepts (whose coefficients are the $\boldsymbol{\alpha i's}$) and uit are uncorrelated. Only $E(\boldsymbol{x}it\ uit) = \mathbf{0}$ must hold. There are $N - 1$ additional parameters for capturing the individual hetroskedasticity.

4.3 The Data

This paper has taken the advantages of panel data which could be expressed in terms of capturing more observation/information, reducing the noise coming from time series (hetroskedasticity is not an issue in panel data analysis), capturing heterogeneity (differences among the groups), studying dynamic changes due to repeated cross-sectional observations. The heterogeneous panel data that involve large time series (T) and small cross-section (N) is employed in this article, i.e., heterogeneous dynamic panel data modelling (also known as panel ARDL). The data used in this article are derived from respective state/central bank's statistical reports, the World Development Indicator (WDI)/IMF/Global economy, and Sigma Re/statistical bureau/ insurance association report. The variables of interest are structured as dependent, explanatory and controlling variables. The dependent variable, economic growth, is measured by real GDP per capita growth (Arena, 2008; Han *et al.,* 2010; UI Din *et al.,* 2017). Whereas the explanatory variables of interest, to capture insurance market activity/development, are represented by three proxies; net insurance premiums measured as the total net insurance premiums paid by all policy holders during a given year, penetration as measured by the ratio of total (life and non-life/property-liability) insurance premiums paid by all the policy holders during a given year to GDP[20], and density as measured by the ratio of total insurance premiums in a given year to total population.

With regard to controlling variables, in line with prior empirical works, this article tried to account for: the effect of human capital measured by the average rate of secondary school enrolment; the effect of monetary principle as measured by the average inflation rate; the effect of terms of trade as measured by the average growth of the terms of trade ratio; the effect of government burden measured by the average ratio of government consumption to GDP; the effect of country's degree of openness as measured by the ratio of the sum of exports and imports scaled by GDP (Arena, 2008); the effect of investment measured by a ratio of FDI to GDP; the effect of labour force measured by the number of persons unemployed in an economy (UI Din *et al.,* 2017); the effect of banking sector development as measured by the ratio of bank claims on the private sector by deposit money banks divided by GDP or by the

[20]*However, the use of such premiums would only capture the role of insurance companies as provider of risk transfer and indemnification rather than their role as institutional investor (Arena, 2008). Data availability issue limits researchers to account for institutional role of insurance companies that could be measured by the ratio of financial investment (Assets) to GDP, such data are available only for OECD countries and for limited periods.*

ratio of bank credit to GDP (as measure of financial intermediary) (Beck and Levine, 2004), measured by a ratio of bank domestic bank credit to GDP (UI Din *et al.*, 2017); the effect of stock market development measured by turnover ratio as measures of market liquidity (Beck and Levine, 2004), measured by stock market capitalization to GDP (UI Din *et al.*, 2017).

In sum, the variables of interest for this article are grouped in main variables as real GDP per capita growth, life insurance penetration, non-life insurance penetration, insurance and financial service export (% of service exports) and private credit to GDP, and control variables as human capital, inflation, government consumption, and the terms of trade. Moreover, the interaction terms between the banking sector development and insurance penetration, and human capital and insurance development are also been incorporated in the empirical estimation to see the complementarity or substitute relationship between insurance development and banking sector development and, insurance development and human capital.

5. Results and Discussion

5.1 Univarate Analysis

Obviously, univarate and bivariate analyses are known to be the building blocks of multivariate analysis, in this paper empirical multivariate analysis involves the variate-linear combination of variables formed in the multivariate technique by deriving empirical weights applied to a set of variables specified by the researcher, (i.e., panel fixed effect and PMG/ARDL), are preceded with summary statistics that describe the distribution of the variables of interest across stock and non-stock countries in the sample.

Table 1 displays the descriptive statistics for the variables of interest in this paper. It can be seen that the real GDP growth (GDP) of the overall sample countries varies from -15.39% to 10.54% with a mean real GDP growth of 2.61% and a standard deviation of 3.96. One can observe from Table 1 that the maximum value of real GDP growth is found identical with 10.54% value for the whole and stock market countries (i.e., Kenya, Uganda, Tanzania, Rwanda and Seychelles), while this value is found 10.40% for non-stock market countries (i.e., Burundi, Eritrea and Ethiopia). As to the dispersion of GDP variable, the standard deviation of 5.15 indicates that observations from this variable are too far from the sample average 1.71 for non-stock countries as compared to stock countries with a standard deviation of 2.93. Capital stock countries are described by high mean value of 3.15 real GDP growth followed by 2.61 and 1.71, whole and non-stock countries respectively.

Table 1 shows the summary statistics for life and non-life insurance penetration for all sample countries. As measured by the ratio of life and non-life insurance premiums to GDP, the total insurance penetration ratio varies from 17.47% to 0.001% with a mean and standard deviation of 1.282 and 3.436, respectively. These

values are found very low for non-stock countries, ranges from a maximum of 0.163 to a minimum of 0.001 with a mean and standard deviation of 0.038 and 0.047, respectively.

From this distribution, it could be inferred that higher value observations for life, non-life and total insurance variables are contributed by countries having capital stock market, suggesting the need for independent empirical investigation of the causal relationship between insurance penetration and economic growth for whole, stock and non-stock countries in the sample. Individually, for life and non-life insurance penetration maximum variations are observed for non-stock and stock countries, i.e., the standard deviations are large enough to explore the variations in the data. For stock countries, life insurance penetration ranges from 14.159 to 0.20, and for the same countries, non-life insurance varies from 1.742 to 0.21, here higher value observations are contributed by life insurance than non-life. For non-stock countries, life insurance penetration varies from a maximum of 0.242 to a minimum of 0.003, while non-life insurance penetration ratio varies from 1.159 to 0.252, as opposed to stock countries; in case of non-stock countries higher value observations are contributed by non-life insurance than life.

Table 1. *Overall sample descriptive statistics*

Variables and samples	Mean	Standard Deviation	Minimum	Maximum
All countries:				
GDP per capita growth	2.610	3.966	-15.392	10.548
Life insurance penetration	1.153	2.906	.003	14.159
Non-life insurance penetration	.737	.387	.210	1.742
Life + non-life	1.282	3.436	.001	17.479
Inflation rate (CPI %)	8.551	8.351	-14.400	44.356
IAFS[1]	2.292	2.250	.000	14.278
Government consumption	2.809	.440	1.942	4.003
Term of trade	4.510	.192	3.967	4.870
Private credit to GDP	17.744	6.921	3.238	31.888
Human capital	40.237	18.254	10.100	82.231
Non-stock countries:				
GDP per capita growth	1.711	5.156	-15.392	10.407
Life insurance penetration	.067	.081	.003	.242
Non-life insurance penetration	.600	.227	.252	1.159
Life + non-life	.038	.047	.001	.163
Inflation rate (CPI %)	10.944	10.845	-14.4	44.356
IAFS[1]	2.032	2.313	.000	14.278
Government consumption	2.957	.411	2.116	4.003
Term of trade	4.531	.206	4.026	4.870
Private credit	18.649	3.345	11.841	26.460
Human capital	33.268	14.447	10.100	59.889
Stock countries:				
GDP per capita growth	3.150	2.939	-8.218	10.548
Life insurance penetration	1.805	3.524	.020	14.159
Non-life insurance penetration	.820	.438	.210	1.742
Life + non-life	2.029	4.179	.008	17.479

Inflation rate (CPI %)	7.115	6.034	-2.404	36.964
IAFS[1]	2.448	2.210	.079	12.767
Government consumption	2.720	.435	1.942	3.854
Term of trade	4.497	.182	3.967	4.802
Private credit	17.201	8.337	3.238	31.888
Human capital	44.419	19.077	11.413	82.231

Note: *IAFS[1] stands for Insurance and financial services (% of service exports).*

With respect to private credit, measured by the ratio of bank claims on the private sector by deposit money banks divided by GDP(%), as proxy for banking sector development, it can be seen from Table 1 that the value of the private credit variable vary from 31.888 to 3.238 with a mean and standard deviation value of 17.744 and 6.921. These minimum and maximum values are identical with values for stock countries, while its mean value is a little bellow the whole samples mean, i.e., 17.201 comparatively, for non-stock countries, values for the same variable varies from 26.460 to 11.841 with a mean and standard deviation of 18.649 and 3.345, respectively, and hence, as indicated by the respective standard deviations, the maximum variations for this variable comes from countries having stock market than non-stock, i.e., the standard deviation is large enough to explore the variation in the data.

The other more important variable is the insurance and financial service export as a percentage of total service export (IAFS). The values of observations for this variable vary from 14.278 to 0.000 with mean and standard deviation of 2.292 and 2.250, respectively, for the total sample countries. The two extreme values observed from the total sample, (minimum 0.000 and maximum of 14.278), are identical with the same values for non-stock countries, and hence, maximum variations are contributed from non-stock countries for this variable, i.e., the standard deviation are large enough to explore the variations in the data. However, regardless of the observed variation, on average, countries having stock market have scored higher amount of insurance and financial service export, as scaled by total service export, than countries with no stock exchange. Similarly, one can observe summary statistics, mean, standard deviation, maximum and minimum, for each control variables in this paper; private credit, term of trade, human capital, inflation and government consumption.

5.2 Multivariate Analysis

Following the univarate analysis, basically showing the basic features of the variables of interest in terms of mean, standard deviation, minimum and maximum values, it is customary to proceed with multivariate analysis involving inferential statistics for hypotheses testing taking in to account the theories and assumptions in each respective theoretical and practical models or estimation techniques. This section empirically investigates the contributions of insurance development to economic growth based on financial intermediation and endogenous growth theories.

Traditional theories of intermediation are based on transaction costs and asymmetric information. They are designed to account for institutions which take deposits or issue insurance policies and channel funds to firms. However, in recent decades there have been significant changes. Although transaction costs and asymmetric information have declined, intermediation has increased. New markets for financial futures and options are mainly markets for intermediaries rather than individuals or firms. These changes are difficult to reconcile with the traditional theories (Allen *et al.*, 1997). In order to explain arguments for existence of financial intermediaries, Ćurak, Lončar and Poposki (2009), argued that the theory of financial intermediation adds specific frictions to models of resource allocation based on the perfect market. Specifically, if there is perfect market, all the traders are price takers, there is no private information, and allocation of resources is Pareto optimal. Thus, in a pure neoclassical framework there is no role of financial intermediation to add value.

But, according to the traditional theory of financial intermediation the real-world market is characterized by frictions that include transaction costs and asymmetric information. The reduction in transaction costs is a result of the main function of financial intermediaries. Financial intermediaries have an advantage over direct financing in economies of scale that result from costs shared. Additionally, large amount of funds enables financial intermediaries to be more easily diversified than individual economic units. An alternative argument for the existence of financial intermediaries is information asymmetry. According to their theory, financial intermediaries are information collectors of borrowers' financial prospects ex-ante for solving the problem of adverse selection. Financial intermediaries can signal their informed status by investing their wealth in assets about which they have special knowledge.

On the other hand, endogenous growth theory arguing that economic growth is primarily the result of internal forces, rather than external ones. It argues that improvements in productivity can be tied directly to faster innovation and more investments in human capital from governments and private sector institutions. It argued that a persistent rate of prosperity is influenced by internal processes such as human capital, innovation**,** and investment capital, rather than external, uncontrollable forces, challenging the view of neoclassical economics[21].

Thus, while the financial intermediation role of insurances, in line with the traditional financial intermediation theory, are captured by life insurance penetration, non-life insurance penetration and total insurance penetration, and by the percentage of Insurance and financial services exports scaled by total service exports, additional control variables are also been incorporated in conformity with the endogenous growth theory; the average rate of secondary school enrolment to account for human capital, monetary discipline captured by the average inflation

[21]*Neoclassical economics is a broad theory that focuses on supply and demand as the driving forces behind the production, pricing, and consumption of goods and services.*

rate, the average ratio of government consumption to GDP to account for government burden, term of trade measured by the ratio the price of the exports by the price of the imports to account for a country's economic health, but it can lead analysts to draw the wrong conclusions, the ratio of bank claims on the private sector by deposit money banks divided by GDP (%) to account for banking sector development[22].

5.3 Stationary Test, Optimal Lag Selection and Cointegration Test

Many economic and financial time series exhibit trending behaviour or non-stationarity in the mean. The levels of macroeconomic aggregates like real GDP are leading examples; hence, determining the most appropriate form of the trend in the data is an important econometric task in this data[23]. To ascertain that no variable is integrated of order 2, it is advisable to perform 1st and/or 2nd generation unit root tests. In order to avoid the spurious regression, an Im, Pesaran and Shin (IPS) panel unit-root test (for assumptions of heterogeneous slopes) was performed to test the stationarity of the variables. Table 2 shows the results of this test. Out of the ten variables, the null hypothesis that all panels contain unit roots was strongly rejected for four variables; the obtained results indicate that the four variables, as indicated in Table 2, are found stationary at level 0. The series for the rest of the six variables were first differenced to solve the problem of non-stationarity, as result all the six variables became stationery at first difference. It can be concluded that the variables are integrated of order one. Besides, although it is optional in the assumption of long-run homogeneity, the result of Pedroni (1999; 2004) cointegration test rejected the null hypothesis of no cointegration at 1% level for panel and group statistics. It is optional because cointegration is ascertained from the statistical significance of long-run coefficients and the error correction term, essentially and/or more generally, long-run relationship presents itself as the joint significance of the level equation.

Using unrestricted model and information criteria the choice of lags has been decided for each unit/group per variable. The optimal lags are determined based on the most common lag for each variable across the eight countries to represent the lags for the model. Following the optimal lag selection, the most common lag across countries was found to be (1,1,0,1,1,1,1,1) and then the PMG/ARDL (p, q, q, q, q, q, q, q) regression, with the first p indicates the lags for the dependent variable and each q represents the lags for the explanatory variables, was estimated. Following Hausman (1978) test of the null hypothesis of homogeneity (difference in coefficients not systematic, PMG and MG estimates are not significantly different. PMG is more efficient based on the comparison between the mean group (MG) and

[22]*Other control variables such as unemployment, age dependency ratio and trade openness have been dropped from the model due to multicolinearity problem.*

[23]*Leading examples are asset prices, exchange rates and the levels of macroeconomic aggregates like real GDP.*

pooled mean group (PMG) estimators, the model supports the PMG as proposed by Pesaran, Shin and Smith (1999) since the null hypothesis of homogeneity cannot be rejected as P-value is found greater than 0.05. The PMG estimator is found as an intermediate estimator between MG and dynamic fixed effect (DFE) estimators, it involves both pooling and averaging of the sample, allows the intercepts, short-run coefficients and error variances to differ freely across the groups, assumes that the long-run coefficients are the same/homogeneous and the short-run coefficients and the error correction term varies across the groups in the panel, generates consistent estimates of the mean of short-run coefficients by taking the simple average of individual unit coefficients.

Table 2. *Stationarity summary*

Variables	Statistics (t-values)	p-values	Stationary
GDP per capita growth	-3.709	0.000	*I*(0)
Life	-6.024	0.000	*I*(1)
nonlife	-2.401	0.008	*I*(0)
Life + nonlife	-8.055	0.000	*I*(1)
Inflation	-3.788	0.000	*I*(0)
IAFS[1]	-8.014	0.000	*I*(1)
Gov.t consumption	-5.889	0.000	*I*(1)
Term of trade	-1.674	0.047	*I*(0)
Private credit	-3.287	0.000	*I*(1)
Human capital	-4.834	0.000	*I*(1)

Note: *IAFS[1] stands for Insurance and financial services (% of service exports).*

As a result, Table 3 shows the PMG estimation results for overall, stock and non-stock countries in the sample. The error correction term (ECT) shows the existence of cointegration among the variables in the panel, implies that there is long-run cointegration at 1% significant level and any deviations from equilibrium are corrected at 79%, 69% and 131% adjustment speed respectively for overall, stock and non-stock samples. Here, the ECT must be negative and significant and be in the range between zero and negative 2, more essentially, the coefficient between -1 and -2 is assumed to be good.

5.4 Long-Run Effect of Insurance Market Activity on Economic Growth

Table 3 shows the ARDL/PMG estimation results to explore the long run equilibrium relationship between life insurance, non-life insurance, and insurance and financial service export and economic growth for the east African economies. Table 3, column 3 and 5, shows the positive effect of life insurance on economic growth for both stock and non-stock countries, however it is statistically significant at 1% level only for countries having stock exchange than for non-capital stock countries. The sign of the coefficient is negative and insignificant while considering the overall countries in the sample. The long-run coefficient for life insurance as proxy for life insurance penetration is positive and significant, reflecting the causal

relationship between life insurance and economic growth for countries having stock exchange and better financial development, which is consistent with previous findings in the literature (Beck 2004; Enisan and Olufisayo, 2009; Arena, 2008; Han *et al.,* 2010; UI Din *et al.,* 2017). This result supports the supply leading argument, which states that well-functioning financial system matters to mobilize limited resources from surplus to deficit area via promoting efficient allocation of resources and thereby lead other real economic sectors to growth (Goldsmith, 1969; McKinnon, 1973; Shaw, 1973; Enisan and Olufisayo, 2009; Olayungbo, 2015; Haiss and Sümegi, 2008). In relative terms, countries having well developed financial systems, (in this case, Kenya, Uganda, Tanzania, Rwanda and Seychelles), enjoy faster and more stable long-run growth than countries having inefficient, with lack of financial infrastructure, and less developed financial systems (in this case, Ethiopia, Burundi and Eritrea). As a result, well-developed markets have a substantial positive impact on total factor productivity, which transforms into higher long-run economic growth[24]. Impact of life insurance on economic growth is driven by stock countries only.

Table 3. *Pooled mean group (PMG/ARDL) long-run and short-run relationship (overall, stock, non-stock countries)*

Variables	(overall) Long-run coefficients	(overall) Short run coefficients	(non-stock) Long-run coefficients	(non-stock) Short-run coefficients	(stock) Long-run coefficients	(stock) Short-run coefficients
ECT		-0.790***		-1.312***		-0.685***
		(0.222)		(0.185)		(0.120)
Non-life	-4.164***	-4.451	-17.60***	7.357***	-0.351	-8.943
	(1.460)	(3.913)	(2.059)	(1.549)	(1.389)	(5.927)
Life	-0.093	-94.63	6.745	-114.5	0.668***	26.34
	(0.620)	(86.64)	(9.956)	(96.66)	(0.217)	(18.00)
Inflation	-0.131***	-0.048	0.000	-0.055	-0.359***	0.136**
	(0.029)	(0.046)	(0.049)	(0.036)	(0.061)	(0.064)
IAFS	0.722***	-0.685	1.231***	-1.272	0.036	0.894*
	(0.098)	(0.861)	(0.165)	(0.855)	(0.133)	(0.487)
Gov. con.	1.740	-4.335	-0.413	-0.883	2.109	-4.199
	(1.198)	(3.302)	(1.181)	(7.197)	(1.436)	(3.208)
Term of trade	9.043***	-1.623	12.95***	-12.32	-10.24***	2.155
	(1.954)	(4.475)	(4.144)	(9.437)	(2.356)	(8.752)
Private credit	-0.651***	0.498	-0.074	0.137	-0.063	-0.449
	(0.078)	(0.386)	(0.109)	(0.560)	(0.105)	(0.417)
Human capital	-0.0824***	-0.145	-0.215***	0.080	0.122***	-0.026
	(0.029)	(0.122)	(0.031)	(0.344)	(0.033)	(0.065)
Constant		-20.64***		-51.39***		26.98***

[24]*Haiss and Sümegi, K. (2006). The Relationship of Insurance and Economic Growth – A Theoretical and Empirical Analysis, European institute university of economics and business administration Vienna.*

		(6.654)		(5.069)		(4.400)
Observations	144	144	54	54	90	90

Note: *Sample of 8 countries (5 stocks and 3 non stocks), 2000-2018 (19-years observations). Standard errors in parentheses. Estimation method: pooled mean group (PMG/ARDL). Real GDP per capita growth is the dependent variable. *** p<0.01, ** p<0.05, * p<0.1' denote statistical significant at 1%, 5%, and 10% levels. IAFS[1] stands for Insurance and financial services export (% of service exports).*

The finding asserts that insurance activity may contribute to reinforcing the process of resource allocation done by banks and capital markets. However, the positive effects of financial development are tailored by the macro policies, laws, regulations, financial infrastructures, and enforcement norms applied across countries and time Arena, (2008), Life insurance is much more affected by regulation so its ratio of premium income to GDP varies across countries (Zweifel and Eisen, 2012).

On the other hand, as can be seen from Table 3, non-life insurance enters in PMG/ARDL regression negative and significant at 1% level in the long-run for the total and non-stock samples, while the short-run coefficients are positive and significant at 1% level only for non-stock countries (Ethiopia, Burundi and Eritrea). None of the short-run coefficients are significant for life insurance. Although, the long-run and short-run causal relationship between life insurance, non-life insurance and economic growth, as estimated by ARDL/PMG, is inconclusive, the potential reason given in the literature is that while Life insurance institutions make long-term investments on the contrary nonlife insurance companies make short-term ones (Zuzana and Petr, 2013). Arena (2008) and Chen *et al.* (2012) point out that life and non-life insurers have different impacts as they provide different services. Insurer companies' activities are still restricted to specific non-life insurance lines of business and this market mainly consists of property insurance and the development of the sector is slow (Albouy and Blagoutin, 2001).

The other core explanatory variable of interest is the insurance and financial service export as a percentage of gross service export (IAFS). The long-run coefficients are positive and significant at 1% level only for the total and non-stock samples. This result favours the Export-Led growth (ELG) hypothesis[25] . The result confirms the positive effect of insurance and financial services exports on GDP growth in developing countries. This effect becomes more recognizable and statistically significant in the long, rather than in the short, run. Theoretically, exports' favourable impacts attributed mainly to the production efficiency gains stemming from improved resources allocation (Beckerman, 1965). Even though, no consensus has emerged on the theoretical appropriateness of the export-led growth hypothesis, growth of export services worldwide is, in fact, lower but still quite remarkable. Hence, this result suggests that financial service export, including insurance,

[25]*The so-called Export-Led Growth (ELG) hypothesis is at least as old as the classical school, as both Adam Smith and David Ricardo supported it (Richards 2001).*

oriented activities in developing countries are concentrated in traditional services sectors, tend to be strongly integrated to the rest of the domestic economy, and are seems under the control of domestic economic agents.

With respect to the rest of the control variables, the long-run coefficients on inflation rate are negative and significant at 1% level for overall and stock samples, and the long-run coefficients on term of trade are positive and statistically significant at 1% level for the total and non-stock countries, while short-run coefficients are negative but insignificant. The positive impact of TOT is considered as rise in exports price is relatively greater than imports price will increase national revenue of exports relative to imports and hence makes imports cheaper as compared to exports and hence will effect economic growth positively. However, negative and significant coefficients are observed in case of countries having stock exchange market, while short-run are positive and insignificant. The potential explanation for the latter might be the volatility of term of trade. This adverse effect of terms of trade (TOT) on countries' economic growth can be considered by the time when the rise in export price is lower than that of import price, so it will lead to decrease the revenues obtained from exports and hence will adversely impact the balance of payment and economic growth.

Similar results have been found by Jebran, Iqbal, Bhatt and Ali, (2018), Jawaid, Tehseen, Raza, Ali (2012), Jebran, Iqbal, Rao, Ali, (2018). In contrast, rate of increase in imports price relative to exports price will adversely impact the economic growth. The negative effect of TOT can also be explained by the phenomena, when domestic demand of foreign goods increases, it leads to a decrease in demand for domestic goods that further effects on the trade balances, and as a result it will adversely impact economic growth. In this regard, Batra and Pattanaik (1971) argued that TOT deterioration may elevate national welfare of a country when there is significant differentiation in inter-sectorial wage rate.

The long-run coefficient on private credit to GDP, as proxy for banking sector development, is negative and significant while considering the entire sample. It is found insignificant when it enters the model for stock and non-stock countries independently, this result may be attributed to a significant statistical correlation between private credit to GDP and insurance variables (0.46 with life and 0.65 with non-life), which might weaken the contribution of this variable and would not allow it to convey additional information to the model. This result is in-line with the findings of Adusei (2013), Arena (2008), Petkovski and Kjosevski (2014) and Prochniak and Wasiak (2017). Private credit to GDP is used as a proxy for banking development; therefore, one possible explanation for this negative relationship might be that the private sector is not using these funds efficiently thereby causing an economic loss.

Table 4. *Linear effect of insurance penetration, insurance and financial service export variables on economic growth*

Explanatory Variables	(overall) GDP	(stock) GDP	(non-stock) GDP
Life + non-life	0.348***	0.426***	-3.770
	(0.118)	(0.0988)	(30.55)
Life	0.415**	0.533***	-19.64**
	(0.165)	(0.141)	(8.390)
Non-life	0.676	2.120**	-10.22**
	(1.191)	(1.062)	(4.645)
Human capital	0.016	0.020	-0.171**
	(0.036)	(0.039)	(0.085)
Inflation	-0.072**	-0.168***	-0.013
	(0.032)	(0.045)	(0.055)
Private credit	-0.288***	-0.101	-0.270
	(0.091)	(0.103)	(0.239)
IAFS[1]	0.270**	0.191	0.341
	(0.133)	(0.140)	(0.289)
Gov. Consumption	-2.496**	0.210	-3.076
	(1.004)	(1.333)	(2.046)
Term of trade	1.514	-1.954	10.55*
	(2.118)	(2.073)	(5.874)
Constant	6.267	10.19	-19.22
	(8.613)	(9.461)	(22.36)
Observations	152	95	57
countries	8	5	3
R-squared	0.242	0.361	0.303

Note: *Standard errors in parentheses. Dependent variable: real GDP per capita growth. Estimation techniques: fixed effect. *** p<0.01, ** p<0.05, * p<0.1, denote statistical significance at 1%, 5%, and 10% levels. IAFS[1] stands for Insurance and financial services (% of service exports).*

The negative relationship between banking development and economic growth could be attributed to soft budget constraints. On top of that, government repression of a financial sector has negative effect on growth (Roubini and Sala-i-Martin, 1992).

Lastly, human capital enters in the model negative and significant al 1% level for overall and non-stock countries, but the coefficient of this variable is positive and significant for countries having stock exchange market. Possible explanations for this divergent result might be attributed to the heterogeneity of countries considered. Heterogeneity can be explained in terms of economic complexity, quality of legal institutions or legal system and property rights, economic opportunities, life expectancy, all in all these are components of social capabilities, without capturing these components in the human capital-growth nexus model might be difficult to

come up with efficient and consistent results whether human capital effects economic growth across multiple countries.

These variables play moderating role, as interaction effect, in the relationship between human capital and growth. These results suggest that, when a country possesses strong institutions and its citizens have ample economic opportunities, it tends to derive better utility from its stock of human capital. Hence, partially, this result might be due to omitted variable biased since it did not incorporate such variables in the model. And, partially, the result could be inferred that human capital plays a positive role in per capita GDP growth only in the presence of better economic opportunities and high-quality legal institutions (Ali, Egbetokun and Memon, 2018). These authors argue that, in fact, economic opportunities reinforce the effect of human capital on growth; the easier it is to do business and trade domestically or internationally, the stronger the effect of human capital on growth.

Besides, Ali, Egbetokun, and Memon (2018) argue that accumulating higher levels of human capital improves growth only when a country has high life expectancy, which ensures that highly qualified individuals contribute to the economy long enough to make a measurable impact. All in all, the result from Table 3 column 5 supports the stylized facts as to economic opportunities for countries having domestic stock market and foreign banks as compared to sample countries with no stock market (i.e., Ethiopia, Eritrea and Burundi). This result is also been confirmed by the fixed effect estimation techniques, as shown in Table 4, for countries having stock exchange market (Kenya, Tanzania, Rwanda, Uganda, Seychelles).

4.5 Linear Effect of Insurance Market Activity on Economic Growth

Table 4, columns 1, 2, and 3, shows the linear effects of insurance penetration, insurance and financial service export on economic growth. The coefficient for the total insurance (life + non-life) is positive and statistically significant for overall and stock countries, while its coefficient is negative and insignificant for non-stock countries. The individual coefficient for life insurance is also positive and significant for both overall and stock countries, while the coefficient for non-life insurance is positive and statistically significant only for stock countries, reflecting the causal effect of both insurance activities on economic growth consistent with (Beck 2004; Enisan and Olufisayo, 2009; Arena, 2008; Han *et al.*, 2010; UI Din *et al.*, 2017).

This result supports the supply leading argument, which states that well-functioning financial system matters to mobilize limited resources from surplus to deficit area via promoting efficient allocation of resources and thereby lead other real economic sectors to growth (Goldsmith, 1969; McKinnon, 1973; Shaw, 1973; Enisan and Olufisayo, 2009; Olayungbo, 2015; Haiss and Sümegi, 2008). However, the coefficient for the total insurance penetration is negative and insignificant, but both of the individual coefficients are negative and significant, column 3, only for non-stock countries reflecting that the positive and significant coefficient for the total

sample is influenced by countries having stock exchange market. This result supports the estimation result of the ARDL model. Table 4, reflects that countries having inefficient banking and insurance activities, with lack of financial infrastructure, and less developed financial systems might affect economic growth negatively. All in all, the positive effects of financial development are tailored by the macro policies, laws, regulations, financial infrastructures, and enforcement norms applied across countries and time (Arena, 2008), life insurance is much more affected by regulation so its ratio of premium income to GDP varies across countries (Zweifel and Eisen, 2012).

With respect to the linear effect of insurance and financial service export to GDP, the coefficient is significant only for the total sample, reflecting the causal relationship between financial service export, including insurance, and economic growth. This result favours the Export-Led growth (ELG) hypothesis. Theoretically, exports' favourable impacts attributed mainly to the production efficiency gains stemming from improved resources allocation (Beckerman, 1965). Even though, no consensus has emerged on the theoretical appropriateness of the export-led growth hypothesis, growth of export services worldwide is, in fact, lower but still quite remarkable.

With regard to private credit to GDP, as proxy for banking sector development, the result in Table 4 confirms the ARDL result in Table 3[26]. The coefficient is negative and significant for the total sample, column 1 Table 4, consistent with the findings of Adusei (2013), Arena (2008), Petkovski and Kjosevski (2014) and Prochniak and Wasiak (2017). One possible explanation for this negative relationship might be that the private sector is not using these funds efficiently thereby causing an economic loss. The negative relationship between banking development and economic growth could be attributed to soft budget constraints[27]. On top of that, government financial repression[28] of a financial sector has negative effect on growth (Roubini and Sala-i-Martin, 1992).

[26]*The long-run coefficient on private credit to GDP, as proxy for banking sector development, is negative and significant while considering the entire sample. It is found insignificant when it enters the model for stock and non-stock countries independently, this result may be attributed to a significant statistical correlation between private credit to GDP and insurance variables (0.46 with life and 0.65 with non-life), which might weaken the contribution of this variable and would not allow it to convey additional information to the model.*

[27]*The soft budget-constraint syndrome, a concept formulated by Kornai (1979), pertains wherever a funding source - e.g., a bank or government - finds it impossible to keep an enterprise to a fixed budget, i.e., whenever the enterprise can extract ex post a bigger subsidy or loan than would have been considered efficient ex ante.*

[28]*Financial repression is a term that describes measures by which governments channel funds from the private sector to themselves as a form of debt reduction. The overall policy actions result in the government being able to borrow at extremely low interest rates, obtaining low-cost funding for government expenditures.*

Concerning other control variables, the coefficients for inflation and government consumption are negative and statistically significant for the overall sample, Table 4 column 1, and the coefficient on terms of trade is positive and slightly significant only for non-stock countries, while it is negative and insignificant for stock countries, Table 4 column 3, again confirms the ARDL result in Table 4 with the same inference given there. The coefficient for human capital is negative and significant only for non-stock countries, while its coefficients are positive and insignificant while considering the total sample and stock countries, reflecting that its positive sign for the total sample is influenced by countries having stock market in the sample. This result confirms the ARDL estimation result, Table 3 column 3, partially, reflecting that when a country possesses poor legal institutions and its citizens have no sufficient economic opportunities, it tends to derive worse utility from its stock of human capital.

4.6 Insurance Penetration and Banking Sector Development

An interaction term is incorporated in the growth regressions to examine whether the measure of life and non-life insurance activity are complementary or not to the measure of banking sector intermediation (private credit to GDP). The interaction terms are created as multiplicative results between total insurance, life insurance and non-life and private credit, respectively as presented in Table 5. Table 5 shows the results of the interaction between private credit and each component of insurance penetration proxies. Regarding the overall (life + non-life), life, and non-life insurance, the results show that the interaction term is positive and significant across all models. Moreover, the impact of interaction terms created between private credit and total insurance penetration, and private credit and life insurance penetration on economic growth is high as compared the impact of an interaction term created between private credit and non-life insurance.

Table 5. *Interaction of insurance variables with private credit*

Variables	(overall) GDP	(life) GDP	(non-life) GDP
Insurance*PC	0.0156***	0.0175***	0.0993**
	(0.004)	(0.0059)	(0.0499)
Private credit (PC)	-0.265***	-0.282***	-0.357***
	(0.085)	(0.0866)	(0.104)
IAFS	0.278**	0.254*	0.291**
	(0.130)	(0.131)	(0.133)
Control variables			
Human capital	0.0187	0.0141	0.0326
	(0.0353)	(0.0358)	(0.0363)
Inflation	-0.0631**	-0.0722**	-0.0554*
	(0.0310)	(0.0318)	(0.0317)
Gov. consumption	-2.384**	-2.343**	-3.304***
	(0.953)	(0.969)	(0.970)
Term of trade	1.337	1.658	0.852

	(2.076)	(2.112)	(2.121)
Constant	6.603	5.668	11.38
	(8.414)	(8.581)	(8.509)
Observations	152	152	152
countries	8	8	8
R-squared	0.258	0.245	0.220

Note: *Standard errors in parentheses. Dependent variable: real GDP per capita growth. Estimation techniques: fixed effect. *** p<0.01, ** p<0.05, * p<0.1, denote statistical significance at 1%, 5%, and 10% levels. IAFS[1] stands for Insurance and financial services (% of service exports).*

This result would suggest that the deeper the country's financial development, the bigger the impact of life insurance on economic growth, reflects a positive complementarity between life insurance and financial development (banking), same inference could be taken from non-life insurance though its impact is lesser, in relative significance, than life insurance, Table 5 column 3. In this regard, Beck and Webb (2003) suggested that life insurance development and its contractual functions are being facilitated by banking sector development. That means, via dedicating payment services and raising confidence in financial institutions, an efficient banking sectors might help develop life insurance. Consequently, life insurance and other forms of contractual savings might foster capital markets to develop through the demand for long-term financial investment, and hence it could be ascertained that life insurance is affected by financial markets and other financial products (Chen, Lee and Lee, 2012).

Other important variables to mention here are private credit to GDP and insurance and financial service export scaled by gross service export (IAFS). The former enters in the regression negatively and significantly while the latter enters positively and significantly across all models with the potential explanation given here before, Tables 3 and 4. With respect to other controlling variables, the coefficients for human capital and terms of trade are positive and insignificant, while the coefficients for inflation and government consumption are negative and significant. Unlike with the previous results, the coefficient for human capital becomes positive while the interaction term between insurance and private credit enters in the growth regression.

4.7 Complementarities between Human Capital and Insurance Variables

Theoretically, it is believed conclusively that human capital to be positively related with economic growth. However, empirically, this relationship does not always hold for several reasons; economic opportunities and legal institutions are among others which contribute for divergent empirical results. As it has been presented in Tables 3 and 4, human capital enters in the growth regression negatively except for countries having stock market in their financial sector. The result is found inconclusive, might be due to the economic opportunity and legal institutions' differences across

countries might be due to the high correlation between human capital and insurance variable, especially with life and total insurance (0.677, 0.646, respectively).

Table 6 shows the results of the interaction between human capital variable and insurance variables (life, non-life, and life + non-life). Across all models, the estimation result shows that the interaction terms between life insurance and human capital, non-life insurance and human capital, and total insurance and human capita are positive and significant. These results would suggest that the deeper the country's financial development, the higher the impact of life insurance followed by non-life insurance, which shows a positive complementarity between human capital investment measured by the ratio of the total secondary enrolment, regardless of age, to the population of the age group that officially corresponds to the level of education, and financial development. In this regard, Kiliç and Özcan (2018) provided evidence of a bidirectional causality linkage between government expenditure on education and financial development in emerging economies.

Table 6. *Interaction of human capital with insurance variables*

	(life)	(non-life)	(overall)
Variables	GDP	GDP	GDP
Insurance * HC	0.005***	0.036*	0.004***
	(0.002)	(0.019)	(0.001)
Private credit	-0.268***	-0.275***	-0.251***
	(0.086)	(0.088)	(0.085)
IAFS[1]	0.261**	0.311**	0.282**
	(0.132)	(0.134)	(0.131)
Control variable			
Human capital(HC)	0.014	0.002	0.019
	(0.036)	(0.038)	(0.035)
Inflation	-0.072**	-0.055*	-0.063**
	(0.032)	(0.031)	(0.031)
Gov. consumption	-2.372**	-3.208***	-2.447**
	(0.976)	(0.965)	(0.964)
Term of trade	1.565	0.897	1.195
	(2.121)	(2.124)	(2.095)
Constant	5.955	10.91	7.241
	(8.636)	(8.519)	(8.495)
Observations	152	152	152
Number of countries	8	8	8
R-squared	0.238	0.218	0.243

Note: *Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1, denote statistical significance at 1%, 5%, and 10% significance levels. IAFS[1] stands for Insurance and financial services (% of service exports). Real GDP per capita growth is the dependent variable.*

The empirical investigation of the matter by Hakeem and Oluitan (2012) suggests two possible directions of causality, one from human capital to financial

development, and evidence of reverse causality for different measures of human capital in South Africa. Besides, Nik, Nasab, Salmani, and Shahriari (2013) suggested that providing financial assistance for the private sector can lead to a business in which they can use their skills and education towards promoting production, this can also be augmented by the strong correlation between human capital investment and insurance variables (0.67, 0.38, 0.64), with life, non-life and total insurance respectively, and between human capital investment and private credit (0.52), and as citizens advance in education they would tend to life insurance contract with insurers. The result indicated in Table 6, as to the effect of the interaction term between human capital investment and insurance variables on economic growth could be inferred from the main theory of human capital which suggest that the more human capital stored in a given economy, the more production promotion accelerates with the help of new technology transferred and its application (Nik, Nasab, Salmani, and Shahriari, 2013).

Apart from the interaction term, the other relevant variables of interest from Table 6 are that of the individual effects of private credit, and insurance and financial service export on economic growth. The former enters the regression negative and statistically significant across all models estimated reflecting that the private sector is not using these funds efficiently thereby causing an economic loss. The negative relationship between banking development and economic growth could be attributed to soft budget constraints. On top of that, government repression of a financial sector has negative effect on growth (Roubini and Sala-i-Martin, 1992). The coefficient for the latter is positive and significant across all models estimated suggesting the causal relationship between financial services export (including insurance) and economic growth. Here the individual effect of human capital investment on economic growth is positive and insignificant; it is positive due to the interaction term and insignificant due to the relative high correlation between the interaction terms and the individual variable itself. As to the control variables, the coefficients for inflation and government consumption are negative and significant as expected, while the coefficient for term of trade is positive but insignificant.

6. Conclusions and Implications

Insurance contributes to the economic growth in terms of promoting financial stability and reducing anxiety, substituting government security programs, facilitating trade and commerce, mobilizing savings, enabling efficient risk management, encouraging loss mitigation, fostering a more efficient capital allocation. Besides, insurance and financial service export, though buried in domestic real exports, is becoming a relevant issue of concern in the empirical research as to its contribution towards economic growth. The evidence mentioned raises questions regarding the impact that both of the faster growth of insurance activity and insurance and financial service export would have an effect on economic growth.

This paper has examined the long-run causal relationship between insurance development, insurance and financial service export, and economic growth in 8 east African countries over the period of 2000-2018. Using PMG/ARDL models on panel data, the long-run coefficient for life insurance premiums shows a positive and significant effect on economic growth for countries having stock exchange markets and better financial development. On the other hand, the long-run relationship between non-life insurance premiums and economic growth is found negative and significant for the total and non-stock market countries. Even though, the long-run and short-run causal relationship between life insurance, non-life insurance and economic growth, is inconclusive, the potential reason given in the literature is that while life insurance's institutions make long-term investments, on the contrary, nonlife insurance companies make short-term ones, point out that life and non-life insurers have different impacts as they provide different services. Besides, this article finds robust evidence of long-run causal relationship between insurance and financial service export, and economic growth for non-stock and overall samples.

With respect to the linear effect of insurance penetration (life + non-life), insurance and financial service export variables on economic growth, this article finds evidence that life and non-life insurance have different impact on economic growth for different levels of financial development. The sum of life and non-life insurance have a positive and significant impact on economic growth for the overall and stock countries, while the sign is negative and insignificant for non-stock countries. Life insurance alone impacts economic growth positively and significantly in case of total and stock countries, while its effect is negative and significant for non-stock countries. While non-life insurance affects economic growth positively and significantly for stock-countries only, however its effect becomes negative and significant only for non-stock countries. All in all, both of these results supplement the supply-leading argument that financial development matters for economic growth.

Regarding the complementarity effects between insurance penetration and banking sector development, this paper finds evidence of complementarity between insurance penetration and economic growth across all models comprises of total sample, stock alone and non-stock alone. Regarding the interaction with the banking sector's development, the result suggests that life insurance would have bigger impact on economic growth as compare to non-life. This result would suggest that the deeper the country's financial development, the bigger the impact of life insurance on economic growth, reflects a positive complementarity between life insurance and financial development (banking), same inference could be taken from non-life insurance though its impact is lesser. Concerning the complementarities between human capital and insurance variables, the empirical result shows evidence of complementarity between human capital investment and insurance development. The effect of the interaction term between human capital and life insurance is found bigger than the effect by the interaction term between human capital and non-life insurance. The complementarity between these two variables suggests that providing

financial assistance for the private sector can lead to a business in which citizens can use their skills and knowledge towards promoting production, and as citizens advance in education they would tend to purchase life insurance contract with insurers. Future research could examine the linear causal relationship between banking sector development and human capital investment, and economic growth especially for economies having undeveloped financial sector.

Most importantly, the findings in this article would be relevant for policy makers in the financial sector that they need to consider the long-run causal relationship ship between life insurance and economic growth where there is better financial development in the sector. Besides, this article would give policy makers new insights as to the complementarity between insurance and banking development, and between human capital and insurance as well. Furthermore, these findings are paramount important especially for east African economies living under undeveloped financial market characterised by sever lack of efficiency in resource allocation towards the private sector and other viable investment undertakings.

References:

Adams, M., Andersson, J., Andersson, L.F., Lindmark, M. 2009. Commercial banking, insurance and economic growth in Sweden between 1830 and 1998. Accounting, Business & Financial History, 19(1), 21-38. https://doi.org/10.1080/09585200802667139.

Adams, M., Andersson, L.F., Hardwick, P., Lindmark, M. 2013. Firm Size and Growth in Sweden's Life Insurance Market between 1855 and 1947: A test of GI brat's law. Business History, June, 1-19.

Adjasi, C.K.D., Biekpe, N.B. 2006. Stock Market Development and Economic Growth: The Case of Selected African Countries. Journal compilation @African Development Bank 2006.

Akinlo, T., Apanisile, O.T. 2014. Relationship between Insurance and economic growth in sub-Saharan African: A panel data analysis. Modern Economy, 05, 120-127. https://doi.org/10.4236/me.2014.52014.

Albouy, F.X., Blagoutin, D. 2001. Insurance and transition economies: The insurance market in Russia. The Geneva paper on risk and insurance Vol, 26, No. 3, 467-479.

Alhassaan, A.L. 2016. Insurance market development and economic growth: Exploring causality in 8 selected African countries. International Journal of Social Economics, 43(3), 1-26.

Ali, M., Egbetokun, A., Memon, M.H. 2018. Human Capital, Social Capabilities and Economic Growth. Economies, 6(2). doi: 10.3390/economies6010002.

Allen, F., Santomero, A.M. 1997. The theory of financial intermediation. Journal of Banking & Finance, 21(11-12), 1461-1485.

Arena, M. 2008. Does Insurance Market Activity Promote Economic Growth? A Cross-Country Study for Industrialized and Developing Countries. The Journal of Risk and Insurance, Vol. 75, No. 4, 921-946.

Baltagi, B.H. 2005. Econometric Analysis of Panel Data, 3rd ed. John Wiley & Sons, West Sussex.

Batra, R.N., Pattanaik, P.K. 1971. Factor market imperfections, the terms of trade, and welfare. The American Economic Review, 61, 946-955.

Beck, T., Levine, R. 2004. Stock markets, banks, and growth: panel evidence. Journal of banking and finance, 28, 423-442.

Beck, T., Levine, R., Loayza, N. 2000. Finance and the sources of growth. Journal of Financial Economics, 58(1), 261-300.

Boon, T. 2005. Do commercial banks, stock market and insurance market promote economic growth? An analysis of the Singapore economy working paper. Nan yang Technological University.

Catalan, M., Impavido, G., Musalem, A.R. 2000. Contractual Savings or Stock Markets Development: Which Leads? World Bank Policy, Research Paper No. 2421.

Chau, W.H., Khin, A.A., Teng, K.L.L. 2013. Economic development Cointegration and Malaysian life and general insurance consumption. Australian Journal of Basic and Applied Sciences, 7(10), 538-546.

Chen, P.F., Lee, C.C., Lee, C.F. 2012. How does the development of the life insurance market affect economic growth? Some international evidence. Journal of International Development, 24, 865-893. DOI: 10.1002/jid.1765.

Ching, K.S., Kogid, M., Furuoka, F. 2010. Causal relation between life insurance funds and economic growth evidence from Malaysia. Asian Economic Bulletin, 27(2), 185-199. https://doi.org/10.1355/ae27-2c.

Cristea, M., Marcu, N., Cârstina, S. 2014. The relationship between insurance and economic growth in Romania compared to the main results in Europe: A theoretical and empirical analysis. Procedia Economics and Finance, 8(14), 226-235. https://doi.org/10.1016/S2212-5671(14)00085-9.

Cristea, M., Thalassinos, I.E. 2016. Private Pension Plans: An Important Component of the Financial Market. International Journal of Economics and Business Administration, 4(1), 110-115.

Ćurak, M., Lončar, S., Poposki, K. 2009. Insurance Sector Development and Economic Growth in Transition Countries. International Research Journal of Finance and Economics, ISSN 1450-2887, Issue 34. http://www.eurojournals.com/finance.htm

Demirgüç-Kunt, A., Levine, R. 1996. Stock Markets, Corporate Finance, and Economic Growth: An Overview. The World Bank Economic Review, Vol. 10, No. 2, 223-239.

Din, S.M.U., Angappan, R., Baker, A.A. 2017. Insurance effect on economic growth-among economies in various phases of development. Review of International Business and Strategy, 27(4), 409-427.

Elias, S., and Fernandez, M., Del, R. 2000. Human Capital Investment, Income Levels and Economic Growth in Latin American Countries. Paper presented at 40th Congress of the European Regional Science Association, Barcelona, August 29-September 1.

Enisan, A.A, Olufisayo, A.O. 2009. Stock market development and economic growth. Evidence from seven sub-Saharan African countries. Journal of economics and business, 61, 162-171.

Ghimire, R. 2014. Contribution of insurance industries in economic development of Nepal. Reflection, 5. Retrieved from http://papers.ssrn.com/sol3/papers.abstract_id=2399986.

Ghosh, A. 2013. Does life insurance activity promote economic development in India: an empirical analysis. Journal of Asia business studies, 7(1), 31-43. DOI10.1108/15587891311301007.

Goldsmith, R.W. 1969. Financial structure and development. New Haven: Yale University Press.

Grace, M.R.,Rebello, M.J. 1993. Financing and the Demand for Corporate Insurance. The Geneva Papers on Risk and Insurance, 18, 147-172.

Gubin, P.N., Litvinova, A.S. and Arsenyeva, A.V. 2017. Types of Financial and Credit Products: Concept, Subject, and Place on Russian and Global Financial Market. European Research Studies Journal, 20(3B), 524-529.

Gujarati, D.N. 2003. Basic Econometrics, 4th ed. McGraw-HiII/ lrwin, New York, NY.

Guochen, P.N., Chiwei, S.U. 2012. The relationship between insurance development and economic growth: A Cross Region Study for China. In Z. Wenyuan (Ed.), China International Conference on Insurance and Risk Management, 1-22.

Haiss, P., Sümegi, K. 2006. The Relationship of Insurance and Economic Growth: A Theoretical and Empirical Analysis, Mimeo, University of Economics and Business Administration, Vienna.

Hakeem, M., Oluitan, O. 2012. Financial Development and Human Capital in South Africa: A Time-Series Approach. Research in Applied Economics, Vol. 4, No. 3.

Han, L., Lib, D., Moshirian, F., Tiana, Y. 2010. Insurance Development and Economic Growth. The International Association for the Study of Insurance Economics, Vol, 35, 183-199

Horng, M.S., Chang, Y.W., Wu, T.Y. 2012. Does insurance demand or financial development promote economic growth? Evidence from Taiwan. Applied Economics Letters, 19(2), 105-111. https://doi.org/10.1080/13504851.2011.568386.

Hou, H., Cheng, S.Y. 2017. The dynamic effects of banking, life insurance, and stock markets on economic growth. Japan and the World Economy, 41, 87-98. doi.org/10.1016/j.japwor.2017.02.001

Hwang, T. 2003. The determinants of the demand for life insurance in an emerging economy: The case of China. Journal of Managerial Finance, 29, 82-96. https://doi.org/10.1108/03074350310768779.

Jawaid, Tehseen, S., Raza, Ali, S. 2012. Effects of Terms of Trade and its Volatility on Economic Growth in India. Online at https://mpra.ub.uni-muenchen.de/38998/ MPRA Paper No. 38998.

Jebran, K., Iqbal, A., Bhatt, K.U., Ali, A. 2018. Effect of Terms of Trade on Economic Growth of China. Emerging Economy Studies, 4(2) 1-12. DOI: 10.1177/2394901518795068.

Jebran, K., Iqbal, A., Rao, Z.U.R, Ali, A. 2018. Effects of Terms of Trade on Economic Growth of Pakistan. Foreign Trade Review, 53(1), 1–11. DOI: 10.1177/0015732516663315.

Kiliç, C., Özcan, B. 2018. The Impact of Financial Development on Human Capital: Evidence from Emerging Market Economies. International Journal of Economics and Financial Issues, 8(1), 258-267.

King, R.G., Levine, R. 1993a. Finance and growth: Schumpeter might be right. Quarterly Journal of Economics, 108(3), 717-737.

King, R.G., Levine, R. 1993b. Finance, entrepreneurship, and growth: Theory and evidence. Journal of Monetary Economics, 32(3), 513-542.

Kjosevski, J. 2011. Impact of insurance on economic growth: The case of Republic of Macedonia. European Journal of Business and Economics, 4, 34-39.

Kugler, M., Ofoghi, R. 2005. Does insurance promote economic growth? Evidence from the UK. Retrieved from http://repec.org/mmfc05/paper8.pdf.

Levine, R. 1998. The legal environment, banks, and long-run economic growth. Journal of Money, Credit, and Banking 30, 596-613.

Levine, R. 1999. Law, finance, and economic growth. Journal of Financial Intermediation, 8,

8-35.

Levine, R., Zervos, S. 1998. Stock Markets, Banks, and Economic Growth. The American Economic Review, Vol. 88, No.3, 537-558.

Levine, R., Loayza, N., Beck, T. 2000. Financial intermediation and growth: Causality and causes. Journal of Monetary Economics, 46(1), 31-77.

Luintel, K.B., Khan, M. 1999. A quantitative reassessment of the finance-growth nexus: Evidence from a multivariate VAR. Journal of Development Economics, 60, 381-405.

Magri, A. Farrugia, A., Valletta, F., Grima, S. 2019. An Analysis of the Risk Factors Determining Motor Insurance Premium in a Small Island State: The Case of Malta. International Journal of Finance, Insurance and Risk Management, 9(1-2), 63-85.

McKinnon, R.I. 1973. Money and capital in economic development. Washington, DC, The Brookings Institution.

Niegomir, V., Stojic, D. 2010. Does insurance promote economic growth: The evidence from Ex-Yugoslavia region. Ekonomska Misao I Praksa, 1, 31-48.

Nik, H.A., Nasab, S.S., Salmani, Y., Shahriari, N. 2013. The relationship between financial development indicators and human capital in Iran. Management Science Letters, 3, 1261-1272.

Olayungbo, D.O. 2015. Insurance Demand, Financial Development and Economic Growth in South Africa: Evidence from Toda-Yamamoto Causality Test. Journal of Applied Economics and Business, Vol. 3, Issue 3, 35-55.

Omoke, P.C. 2012. Insurance market activity and economic growth: Evidence from Nigeria. Acta Universities Danubius, 8(2), 34-47.

Pagano, M. 1993. Financial Markets and Growth: An Overview. European Economic Review, 37, 613-622.

Robinson, J. 1952. The generalization of the general theory, in the rate of interest and other essays. London: Macmillan.

Romer, P.M. 1990. Endogenous technological change. Journal of Political Economy, 98, S71–S102.

Roubini, N., X-Sala, M. 1991. Financial development, the trade regime, and economic growth. Working paper no. 3876, NBER, Cambridge, MA, Oct.

Rousseau, P.L., Wachtel, P. 2000. Equity markets and growth: Cross-country evidence on timing and outcomes, 1980–1995. Journal of Banking and Finance, 24(12), 1933-1957.

Rule, D. 2001. Risk Transfer between Banks, Insurance Companies and Capital Markets. Financial Stability Review, 11, 127-159.

Rupeika-Apoga, R., Zaidi, H.S., Thalassinos, E.Y., Thalassinos, I.E. 2018. Bank Stability: The Case of Nordic and Non-Nordic Banks in Latvia. International Journal of Economics and Business Administration, 6(2), 39-55.

Schumpeter, J. 1912. The theory of economic development, Leipzig: Dunker and Hum blot. Translated by Redevers Opie. Cambridge, MA, Harvard University Press.

Shahbaz, M., Ahmed, N., Ali, L. 2008. Stock Market Development and Economic Growth: ARDL Causality in Pakistan. International Research Journal of Finance and Economics, 14.

Shaw, E.S. 1973. Financial deepening in economic development. New York: Oxford University Press.

Skipper Jr., H. 1997. Foreign insurers in emerging markets: Issues and concerns. Center for Risk Management and Insurance. Occasional paper, 9792.

Stem, N. 1989. The economics of development: A survey. The Economic Journal, 100, 597-

685.
Thalassinos, I.E., Stamatopoulos, D.T. and Thalassinos, E.P. 2015. The European Sovereign Debt Crisis and the Role of Credit Swaps. Chapter book in The WSPC Handbook of Futures Markets (eds) W. T. Ziemba and A.G. Malliaris, in memory of Late Milton Miller (Nobel 1990) World Scientific Handbook in Financial Economic Series Vol. 5, Chapter 20, pp. 605-639, ISBN: 978-981-4566-91-9, (doi: 10.1142/9789814566926_0020).
Tong, H. 2008. An investigation of the insurance sector's contribution to economic growth Prospect LLC. Lincoln, NE, University of Nebraska.
Ul Din *et al.* 2017. Does insurance promote economic growth: A comparative study of developed and emerging/developingeconomies.Cogent Economics & Finance, 5. doi.org/10.1080/23322039.2017.1390029
Verma, A., Bala, R. 2013. The relationship between life insurance and economic growth: Evidence from India. Global Journal of Management and Business Studies, 3(4), 413-422.
Ward, D., Zurbruegg, R. 2000. Does insurance promote economic growth? Evidence from OECD countries. The Journal of Risk and Insurance, 67(4), 489-506. https://doi.org/10.2307/253847.
Webb, I., Grace, M.F., Skipper, H.D. 2002. The effect of banking and insurance on the growth of capital and output. Working Paper 02, Center for Risk Management and Insurance.
Zou, H., Adams, M.B. 2006. The Corporate Purchase of Property Insurance: Chinese Evidence. Journal of Financial Intermediation, 15(2), 156-196.
Zouhaier, H. 2014. Insurance and economic growth. Journal of Economics and Sustainable Development, 5(12), 102-113.
Zuzana, R., Petr, K. 2013. Impact of insurance sector activity on economic growth: A met analysis. Acta Universities Agricultural Silviculturae Mendelianae Brunei's, LXI, No. 7, 2677-2683.
Zweifel, P., Eisen, R. 2012. Insurance Economics. 1st ed. Berlin, Springer New York.

Appendix A: *List of sample countries*

Economies with stock market	Economies with no stock market
Kenya	Ethiopia
Tanzania	Eritrea
Uganda	Djibouti
Somali	Comoros
Seychelles	Burundi
Rwanda	
South Sudan	
Sudan	

Appendix B: *Definition and source of variables used in regression analysis*

variables	**definition/measurement**	**source**
GDP	Real per capita GDP growth (annual %)	WDI
GDPC	GDP per capita (current $US)	WDI
LIF	The ratio of life insurance premiums to GDP	Financial structure database, Thorsten Beck, and various

		issues of Sigma
NLIF	The ratio of non-life (property-liability) insurance premiums to GDP.	Financial structure database, Thorsten Beck, and various issues of Sigma
SES	The ratio of the total secondary enrolment, regardless of age, to the population of the age group that officially corresponds to the level of education.	WDI
CON	consumption expenditure (% of GDP)	WDI
TOT	Term of trade: used as an indicator of a country's economic health. Measured by the ratio of price of exports to price of imports*100.	WDI
INF	Inflation, consumer prices (annual %)	WDI
PC	PRIVATE CREDIT BY DEPOSIT MONEY BANKS to GDP (%). Private Credit (Banking Sector Development) .The ratio of bank claims on the private sector by deposit money banks divided by GDP. The ratio of bank credit to GDP (measure of financial intermediary)	Respective state/central bank's statistical reports, and World development indicator (WDI)/ IMF/Global economy
FDI	foreign direct investment .Foreign direct investment in percentage .A ratio of FDI to GDP	WDI/international monetary finance/Global economy
IAFS	Insurance and financial services (% of service exports, BoP)	WDI/international monetary finance/Global economy

Appendix C: *Overall sample correlations*

Variables	GDP per capita growth	Life	Nonlife	Life + nonlife	Inflation	IAFS	Gov. Consumption	TOT1	PC	LSES
GDP per capita growth	1									
Life	0.080	1								
nonlife	-0.157	0.390***	1							
Life + nonlife	0.098	0.924***	0.535***	1						
Inflation	-0.169*	-0.006	0.007	-0.045	1					
IAFS	0.018	-0.030	0.138	-0.058	-0.211*	1				
Gov.t consumption	-0.384***	0.335***	0.289***	0.328***	0.068	-0.116	1			
Term of trade	-0.140	0.200*	0.140	0.192*	0.067	-0.023	0.197*	1		
Private credit	-0.233**	0.464***	0.655***	0.440***	0.023	0.195*	0.488***	0.428***	1	
Human capital	-0.043	0.677***	0.387***	0.646***	-0.086	-0.002	0.257**	0.549***	0.523***	1