

Impact of Cost of Marine and General Insurance on International Trade and Economic Growth of Pakistan

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Abstract: Economists hold that trade deficit in the long run can drag-down economic growth of any country. As globalization provides countless opportunities for international trade meanwhile numerous commercial and political risk are there too in carrying out cross-border trade. Pakistan is facing the persistent trade deficit since independence¹. In addition to this war on terror and poor law/order situation, the risk of theft/damage/lost during the cross border trade has increased dramatically. To hedge these risks, companies insure themselves under different private and government insurance policies. The objective of this study is to investigate the long-term and short-term relationship between marine, general insurance, trade openness and economic growth in Pakistan for the period 1982 to 2009. This study implies the ARDL and VECM tests to check the long-term and short-term relationship between variables under study while OLS and Granger Causality test is used to check the impact of marine insurance on trade openness and the direction of relationship respectively. The results reveal that there exists positive long-term relationship between general insurance and economic growth. However, trade openness negatively effects economic growth in the longer run. Similarly, marine insurance has significant relationship with the trade openness but effecting trade openness negatively in the longer run and the relationship is bi-directional in nature. Our study has explored another important factor that is negatively effecting the trade of Pakistan. Policymakers should devise strategies to somehow minimize the negative effect of insurance policy on international trade.

Key words: Marine Insurance • International Trade • Economic Growth • General Insurance

INTRODUCTION

According to World Bank projections for 2009, world's economy will contract at an annualized rate of 3 percent and international trade will shrink by 9.7 percent due to reduction in demand, high trade credit cost and credit risk [1]. Furthermore, the crises will spread from one country to other due to global integration of countries in term of trade, finance and international migration [2].

History of trade among countries and individuals is as old as human beings themselves. In the early 13th and 14th centuries, travelling merchant, caravan trade and champagne fairs were used to sell goods in European countries but with the passage of time the trend of hiring

agents in different countries on behalf of the sellers emerged. Sellers began to send goods to their agents in different countries carrying additional cost of shipment. At the same time reduction in trade barriers, globalization and invention of internet, now consumers are more knowledgeable than few decades before; business organizations have widely dispersed customers; seeking varieties of products and services. Organizations try to satisfy their customer needs and wants either by establishing subsidiary (when there is growing and consistent demand) or by exporting the goods/services to other countries. Either establishing a subsidiary or exporting goods both effect the economic condition of the country either by resulting in higher GDP/GNP

¹Except in the year 1951 and 1972

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(all the products and services produced in the economy) or by improving balance of trade (difference between export and import). The countries should produce what they have comparative advantage in and then be benefited from mutual trade. This promoted the idea of international trade. All the goods and services produced in an economy can be classified either as tradable (car, cotton, sugar etc) perhaps with some difficulty and additional cost or non-tradable (haircut, house-cleaning etc) and countries compete with each other in tradable goods, over price of the goods [3].

During the great recession of 1930's, countries followed the "beg thy neighbor" policies in which they tried to shift their economic problems to neighboring countries, imposing high tariff and willingly depreciating their currency value almost destroying the international trade. As per [3] international trade can be restricted in many ways i.e. high tariffs (specific, ad valorem and prohibition), import/export quotas, licenses, technical specifications, subsidies and so on. After the Second World War, world realized the need of international trade that can be beneficial for the society as a whole. As a result, General Agreement on Tariffs and Trade (GATT) was founded in 1948 as de facto international organization that subsequently in 1995 converted into World Trade Organization (WTO) as official international organization. The core objectives of GATT were to lower the tariffs and to promote free trade among countries (pp. 220-222). Developed countries dramatically reduced the tariffs, which now average approximately 4% while for developing countries it is 20% [4].

Although globalization provides opportunities but at the same time, it involves numerous commercial (i.e. Bankruptcy, Insolvency, Natural disasters, Economic conditions etc) and Political (Currency exchange rate, War, Confiscation etc) risks. Insurance is the key driver for promoting cross border trade and investment [5]. To hedge these risks, companies usually insure themselves under different private and government insurance companies. These agencies cover almost all the commercial and political risks, supporting the international trade, business and commerce. Hence, promotes trade, commerce and entrepreneurial activities [6]. As also mentioned by [7, p.13] that long distance trade is not without risk, marine insurance facilitates the long distance trade, which subsequently contributes into economic growth.

Initially people used to sell goods in their own villages and gathering society. With the passage of time, they turned to nearby villages to sell [8]. However, they realized that selling this way, involves not only the risk of loss (i.e. damaged, theft or life of trader as well) but also they cannot cover the wider market. Therefore, the trend of hiring commissioned base agents across different markets emerged [9]. Nevertheless sending goods to the agents involves different risks i.e. sea storms, pirate attack; goods may be damaged due to poor handling while loading and unloading, etc. Traders exploited different measures to hedge the risk involved in the exporting. Instead of sending all the goods on one ship/truck, they used to send their goods over number of vessels to avoid the total loss of shipment if the vessel was caught in a sea storm, fire, pirate, or came under enemy attacks but this was not good practice due to prolonged time and efforts involved. Insurance is the oldest method of transferring risk, which was developed to mitigate trade/business risk [10]. Marine insurance is very important for international trade and makes large commercial trade possible [11]. According to [12] the risk hedging instruments our ancestors used to mitigate risk in medieval times were sea/marine (Mutuum) loans, commenda contract and bill of exchanges. it was highlighted that commenda contract and sea loans were almost the closest substitute of marine insurance [13].

At the time of independence, five domestic and 77 foreign insurance companies were operating in Pakistan under act of 1938. Later on, two more *Habib Insurance of Bombay* and *Eastern Federal Union Insurance of Calcutta* shifted their operations into Pakistan, making a total of seven domestic companies [7]. Ministry of Commerce was the supervisory institute under the Act of 1938 [14]. The Act of 1938 was replaced with the new Insurance ordinance 2000 by the SECP that increased the minimum paid-up capital of non-life insurance companies from Rs 40 million to Rs. 80 million and for life insurance companies from Rs 100 million to Rs. 150 million and supervisory authority was given to SECP instead of Ministry of Commerce². Currently, there are forty-nine insurance companies, out of which thirty-six provide non-life insurance, seven provide life insurance and five are the takaful and one reinsurance company.

it was pointed out that in 1948-9, India and UK were the main trading partners for Pakistan and raw jute, raw cotton, raw wool, hides and tea were the primary exports, which constituted 99% of Pakistan's export making

²(Security and Exchange Commission of Pakistan, 2000, p. 37)

Pakistan as an unindustrialized developing country. During the same time, our exports to India were 56% that later on reduced to 4.1% [15, P-159]. Similarly, our reliance on Indian's imports also decreased with time. Pakistan's balance of trade is in deficit except for the periods 1947-8, 1950-1 and 1972-3 and has worsened every year. The major imports of the Pakistan consist of Edible Oil, Petrol and petroleum products, Machinery, Vehicles, Tea, Silk and electronic goods. Petroleum products, machinery, vehicles and edible oil constitute almost 70% of total import bills [16].

Extensive literature is available on the role of financial intermediation in economic development. However, literature concluded that either banking industry or capital market are the financial intermediaries which promotes the economic growth while insurance sector remain ignored [17-19]. Due to high commercial and political risk in Pakistan, insurance companies are charging higher premiums making Pakistani final goods more costly in international market, consequently lowering the share of balance of trade into GDP. Therefore, it is very vital to study the impact of marine insurance on trade of Pakistan that subsequently effects economic growth. This study will examine how the cost of marine and general insurance effects trade and economic growth respectively.

Literature Review: Exports is the difference between the quantity of goods produced and consumed within a country. If the cost of production is higher, then a country may prefer to import from other countries rather than producing it. In addition, international trade is the relationship between the supply and demand structures of economy [3, p. 115-116]. While according to David (1817) cost of goods does not mean the cost of production but the cost of buying (cost of product plus other costs of acquiring goods). Exports increases economies of scales, production efficiency through acquiring state of art technology, better allocation of economic resources and create employment opportunities, which subsequently improve economic growth [20]. However, excessive variations in exports can hinder economic growth because now small funds are available to import capital goods for development [16].

The gain from international trade can be classified either as *static* arising from the specialization as stated by Smith in Absolute advantage or *dynamic* gains arising from production possibilities at large (economies of

scale, transformation of knowledge and foreign direct investment) [4, p.626]. Furthermore, he stated that the cause which determine the economic progress of country belong to the study of international trade. Similarly, [21] highlighted that every country tries to follow the export led growth strategies because trade plays vital role in economic development. it was argued that since 1950, export is the most important factor out of many, which developing countries needs to maintain persistent economic growth [4, p.619]. Likewise, [22] stated that in 1960's Pakistan export were higher than the other countries i.e. Malaysia, Indonesia, Thailand etc. however, due to poor management policies and frequent change in Government not only our balance of trade suffered but it also increased our foreign debt. In addition, [23] argued that both trade and non trade related policies influence the imports/exports of a country. Therefore, coherent and integrated business and trade strategies are very important for consistent and growing trade.

Literature identified different important factors i.e. Human Capital, Innovation, R and D, Investment and Saving, Economic Policies, Openness to Trade, Foreign Direct Investment, Institutional framework, political stability and Macro-economic Stability of the country, Socio-cultural factor(i.e. religion, diversity, trust and so on), Geographic Importance and Demographic Structure that are vital for the economic growth of a country [24-26; 8; 28]. Neoclassical models (Heckscher-Ohlin) highlight that the capital, labor and technology are the main factors of economic growth [29, p.26]. Moreover, literature identified that to achieve sustainable economic growth, trade is very important and researchers used degree of openness, term of trade, export performance as a proxy for trade [20].

As stated earlier trade is vital for economic growth, but at the same time, numerous commercial (i.e. Bankruptcy, Insolvency, Natural disasters, Economic conditions etc) and Political (Currency exchange rate, War, Confiscation etc) risks are involved in the trade as well. Therefore, cross-border trade is not without risk while insurance facilitates the cross border trade, which subsequently contributes into economic growth. Economist, behaviorist, statisticians and risk theorist have their own definition for risk but they all generally agree on one common notion of risk i.e. uncertainty.

Risk is a situation in which outcomes of the actions are uncertain but we can assign probabilities to possible outcomes through mental state known as subjective risk,

variance in future returns, chance of loss, or possibility of huge deviation among actual and expected return known as objective risk³. Risk increase the burden of emergency funds to cope with adverse situations, loss of certain goods and services to general population and creates fear and uncertainty in the environment. Private insurers are interested to insure the particular risk while government agencies insure the fundamental risk. However, risk can be managed by implying one of these methods; (1) avoid taking risk at all; (2) controlling the frequency or severity of loss either by loss prevention or by loss reduction; (3) Retaining all or part of the risk either intentionally or unintentionally; (4) transferring the risk to noninsurance companies by contracts, future hedging, or business incorporations; (5) by purchasing the insurance. Similarly, [30] identified two types of risk with reference to trade insurance are (a) Commercial risk and (b) Territorial risk. Commercial risk arising from buyer's financial and economic condition, his ability and willingness to pay. While expropriation, nationalization, moratorium (payment Ban), inability to transfer funds, and war constitutes territorial risk.

American Risk and Insurance Association defines insurance as "the pooling of fortuitous losses by transfer of such risks to insurers, who agree to indemnify insured for such losses, to provide pecuniary benefits on occurrence, or render services connected with the risk." Insurance has these distinctive features i.e. risk transfer, pooling technique, payment of fortuitous losses and indemnification [31, p-18]. Similarly, [33] defined insurance as diversifying the risk, by paying claims against losses out of actual or promised contribution from large number of individuals. Moreover, [12] defined Insurance as paying regular/proportional sum to avoid uncertainty in the future, distributing the risk over large number of individuals, encouraging the risk-averse individuals to take risk. Insurance can also be defined as shifting the risk of anticipated loss from one entity to other entity by paying fraction of loss known as premium. While, [14] defined insurance as reducing the financial risk by hedging the risk from insured to insurer.

Insurance companies can be classified as life insurance companies, which sell life insurance, annuities and pensions products and non-life or general insurance companies, which sell other types of insurance i.e. Auto, Health, Marine, Trade/credit etc. The main difference between life and non-life insurance companies

is the time to maturity of policy. Life insurance is considered to be covering the risk over many decades while non-life insurance is short-term in nature. In Pakistan, insurance sector has performed well because of deteriorating macroeconomic factors and poor law and order. Moreover, non life insurance is closely correlated with economic growth than the life insurance [34]. Non-life insurance is growing more rapidly than the life insurance reason being more and more organizations are engaging in international trade and commerce [35].

Marine insurance also known as transportation insurance because it insures the risk associated with the transportation of goods from one point to other [31]. Furthermore, he classified marine insurance either as *Ocean Marine Insurance*, insuring the entire ocean going vessel and cargo or as *Inland marine Insurance*, insuring the goods transported through land. Merchants in Medieval times, used proto-statistic (frequency and severity) estimation of risk, experience based approach, or intuitive approach to measure the risk involved in trade [32]. Factors like government regulations (Tax, Trade restrictions etc), reputation of insurance companies (how fast they settle claims) and fair arbitration in case of dispute were vital while purchasing marine insurance. The most important consideration for traders was the reputation and ability of insurance provider to pay when policies becomes due. Furthermore, traders may pay higher premiums when insurance providers were financially strong enough to indemnify the losses [12, p-9]. In addition, [36] stated that as the volume of international trade increased, contract agreement and enforcement emerged as major concern for traders (not only force parties to obey the agreement but also protection of goods). However, [12] found that there exist agency problems in the marine insurance industry. Furthermore, he pointed out that policy writer faced the problem of adverse selection, morale hazard (being careless due to insured) and moral hazard (behaving in dishonest manner that increases the frequency or severity of loss)⁴ while reputation and solvency of policy writer were the major concerns of the policyholders. It was found that by involving brokers into policy writing and holding, information asymmetric and agency problems can be reduced [12]. Different international rating agencies provide solvency rating of insurance like A.M Best company, Moody's, Standard and Poor's and Duff and Phelps [37, p. 119].

³(Rejda, 2003)

⁴(Rejda, 2003)

There are two widely used methods regarding insurance responsibility i.e. Free on Board (FOB) and Cost, Insurance and Freight (CIF). FOB method includes the cost of merchandise, transportation and loading cost on vessel [38]. Under the FOB method, the responsibility of purchasing insurance (marine) reside with the seller and all the risk of damaged and lost of goods remained with seller until the goods loaded on ship while under CIF method, all the insurance, freight cost remains with the seller until the goods reach their destination [11]. All the imports in Pakistan are under FOB while the exporters are free to choose among FOB and CIF method [39].

From the literature, we can argue that insurance boosts the trade, transportation and other sectors that are vital for economic growth [18]. International trade stimulates the economic growth for the developing countries [15, p. 160]. However, increased cost of exports significantly reduces the economic growth of developing countries as compared with developed [3, p. 272]. Pakistan, After being the front-line strategic partner against terrorism, instead of development, the situation is getting worsen day by day, due to terrorist attacks, poor law and order situation, now the risk of transporting goods within and outside the country increased. Hence, the cost of transport/marine insurance has increased. Therefore, Policy-writers need to know the risk involved in shipment, complete and accurate information about route and political stability at home and abroad to charge fair premium [12].

The export of goods from one country to other involves additional time, efforts and cost as well. Goods have to be physically packed, loaded, insured, transported, unloaded etc before they reached their final destination. Hence, all of these processes involves additional cost which trend to increase as the distance of destination increases. As a result, firms that are exporting goods to other regions/countries charge higher prices compared to domestic customers while consumption level in economy depends only on the final goods prices [3, pp. 118 and 268-270]. Therefore, companies find it hard to incorporate high insurance into final product prices because they may not be able compete over tradable goods in international market [7, p. 209]. Whereas [23] found that reducing the cost of exporting significantly effects exports.

Cost of insurance can be measured using two factors; (1) structural factors that are predictable, observable and stable over period of time (i.e. physical condition of

vessel, reputation of Captain, the weather, distance between point of origin to destination and the merchant itself); and (2) contingent risk factors, which are hard to predict [32]. The insurance premium, in medieval times, is determined on the bases of both these factors.

After World War II, the volume of international trade increased by almost 100% and 80% of world trade carried-out through sea. However, during 2010, almost 600 cargo ships were pirated in 18 countries (Pakistan is one of them) around the world and a total loss of 7-12 billions US dollars to world economy. Similarly, in last five years period 2006-10, 1600 piracy attacks reported⁵. Re-routing the shipment not only increase the distance and time but also additional cost of fuel as well. However, insurance premiums are determined on the bases of risk involved rather than the distance. Furthermore, he pointed out that at-least 50% of the insurance premium is for the coverage of war and political stability of country and companies charge lower premiums for safe routes than the war zone. For instance, in Barcelona the premium charged for Catalan city to Messina at 26 June 1461 were 3.5% while on July 1 it was 10-12%. This fluctuation in rates can be explained by the news about the safety at sea [32].

The insurance premium charged on vessels travelling between war zones should be as higher as 300 fold than non-war zone. While the premiums for kidnap and ransom increased by 10 fold, for cargo it increased by four fold and for hull insurance premiums are doubled in past few years. Furthermore, [11] argued that determining the premiums for marine insurance is most difficult, due to varying nature of risk involved. Insurers are unable to formulate fair premium for marine insurance compared with other life and non-life insurance products. Resultantly, how much to charge for any marine policy is a great concern for any insurance provider [40, p. 134-136]. Insurance companies must charge fair premium due to competition, which may cover expected claims cost, profit on investment and administrative expenses as well. If a group of policyholders has, the same (homogeneous) risk/expected losses then company can charge the same premium from all the policyholders it is known as equal treatment prospective. On the other hand, when the policyholders have varied (heterogeneous) degree of risk involved, then charging the same premium from all policyholders can constructs the adverse selection from the company's prospective. Therefore, less risky policyholders may switch to more careful treatment prospective company rather than paying equals to high-risk individuals.

⁵(Bowden, 2010)

Insurer face the problem of moral hazard in writing policies i.e. faking an accident to collect from insurer, claiming a fake loss, manipulation of claims and burning/destroying unsold/low productive goods that are insured. As the insurers charge premiums based on the experience therefore, they charge higher premiums if there were frequent/large number of claims in the history. Hence, the moral hazard increases the amount of premium in almost all kinds of insurance [31].

Due to frequent pirate/terrorist attacks, the cost of transporting has dramatically increased [12]. Therefore, insurers usually charge higher premiums, which adversely effect the international trade. He pointed out due to piracy attacks in the Gulf of Aden, the cost of insurance rose from 900\$ to 9,000\$ during one year time period 2007-2008. When the company estimates the expected losses of each buyer and charged premium according to risk level is known as risk categorization.

Non Life Insurance and Economic Growth: The Economists hold different views about the role of financial sector in economic development. [6] and [41] emphasized that financial sector contributes into economic growth by performing these functions (1) better risk pricing, hedging, diversifying and pooling of risk, (2) Allocate resources, (3) Monitor managers and exert corporate control, (4) Mobilizing savings and (5) promoting trade and commerce and (6) promotes financial stability and reduce anxiety.

Financial sector has positive relationship with the economic-growth [41]. While most of the studies regarding role of financial sector in economic development revolve around the banking industry or stock market but insurance sector remain ignored. Nevertheless, insurance companies provide risk protection, collecting funds from corporations and individuals and investing them (financial intermediation)

Table 1: Insurance and Economic Growth

Author(s)	Scope	Method Result	Result
Outreville (1990)	Fifty-five Developing Countries	Cross Section Analysis	Financial sector in developing countries is an important element of economic development and therefore increase the supply of the insurance industry argued that policies should be continued
Mohammad (1998)	Kuwait	Regression Analysis	A one per cent increase in per capita income, the insurance sector increased 2.9 percent efficiency
Ward ve Zurbruegg (2000)	Nine OECD Countries	Granger Causality Test	A section of the relevant countries, the insurance sector to economic growth, another section of the insurance industry have achieved the right result is a causal relationship.
Webb vd. (2002)	55 Countries	Cross Section Analysis	Banking and insurance sector has a positive effect on economic growth, the result is stronger than the effects obtained independently from each other.
Kugler ve Ofoghi (2005)	UK	Co-integration	Co-integration relationship between economic growth and insurance sector and both short-and long-term insurance sector to economic growth have found that there is a causal relationship
Adams vd. (2005)	Sweden	Co-integration and Causality Test	The development of the banking sector and insurance sector has a positive effect on economic growth
(Haiss and Sümegi, 2006)	29 European countries	panel data analysis	Empirically the authors, found weak relationship between insurance and economic growth
(Arena, 2006)	56 countries	Panel Data	Both the Life and non-life insurance significantly effects economic growth. However, life insurance effects economic growth in high-income countries while non life insurance effects economic growth in both low incomes as high countries as well.
Vadlamannati (2008)	India	Co-integration and Causality Test	Insurance sector reforms positively effect economic growth and financial intermediation services are an important part of the insurance industry
(Curak and Loncar, 2008)	43 European Countries	Panel Data Analysis	The author found a positive relationship between life insurance and economic growth but found insignificant relation between non-life and growth
(EGE and Bahadır, 2011)	OECD Countries	Panel Data Analysis	The author found that insurance sector effects economic growth positively.

into different economic units to support economic growth [18 and 42]. Financial intermediaries performs following functions i.e. reduction in transaction cost, information asymmetric (adverse selection and moral hazard), risk sharing and pooling the funds from savers to borrowers [43]. In addition, insurance provides better pricing of risk, efficient allocation of capital into economy and productivity improvement [5].

This study highlights the importance of insurance industry and marine insurance in promoting international trade and economic growth of country. According to literature review, openness can enhance the economic development of any country ⁶; there exists a bi-directional relationship between openness and economic growth. That means not only trade influences the economic growth but economic growth also influences the trade [24-26; 36; 16; 4, p-632; 20; 44, p-26; and 45]. However, [21] found that this trade led hypothesis don't exist for Pakistan but the opposite. Based on literature review we can say that for some countries there exists a positive relation of openness and economic growth and reverse is true for others. Therefore, we can hypothesize that in case of Pakistan

H1: Trade Openness positively or negatively influence on Economic growth.

Economic Growth and Non-life Life: Insurance, as mentioned above, is based on transferring the risk of individuals and institutions to financial institutions, which are better able to understand/measure financial risk and how to manage it ⁷. Insurance not only provides risk coverage but also helps in efficient allocation of economic resources; perform intermediating function and reduction in transactional cost. Several authors i.e. [46; 41; 34; 35; 47; and 43] stated that financial institutions (Banking, Stock markets, and insurance industry) positively effects economic growth.

In addition, [5] found that life insurance industry promotes economic growth in developed countries, while for developing countries like Pakistan Non-life/General insurance works well. Based on literature view the author can hypothesised that non-lifev/general) insurance positively effects Economic growth.

H2: General Insurance Industry positively influences on Economic growth.

Marine insurance as mentioned above is the transportation of goods from one point to other safely [31]. Furthermore, all the transportation either by sea, air, or land comes under the marine insurance domain. As mentioned above the positive balance of trade account is very important in economic growth of any country in long run and balance of trade is very important element of balance of payment. While insurance is used to hedge the risk involved in national/international trade. As the international trade based on either FOB or CIF and cost of physically packaging, loading and unloading, insurance and transport charges are part of export's price. As the prices of insurance and transportation charges increase, international trade suffers due to incompetency of efficiently competing with low cost products. Marrewijk [3, p. 272] found that this increasing cost of exports reduce the international trade of developing countries, like Pakistan as compared with the developed ones. After being the front-liner against the war on terror, the risk has increased substantially. Moreover, the insurance premiums base on risk rather than distance. Therefore, companies find it hard to incorporate high insurance into product price because they may not be able compete over internationally [7, p. 209]. Based on literature view the author can hypothesized that cost of marine insurance negatively effects openness.

MATERIALS AND METHODS

Data Sources: We used the secondary data in this study. The data of GDP, imports/exports and insurance industry/marine premiums retrieved from various issues of Pakistan statistical bureau, World Bank, State Bank of Pakistan and Ministry of Finance's websites from 1982 to 2009.

Measurements: Michaely (1977) used simple correlation analysis to test the hypothesis of trade accelerating economic growth containing 41 countries for a period of 1950 to 1973. He found strong correlation between trade and economic growth. similarly, [48] performed simple regression analysis containing data of 10 countries from 1956 to 1974. Most of the researchers used the linear econometric model given below (1.1)⁸.

[48; 49; 50; 51; and 52] investigated exports and growth performance within a neoclassical framework by using ordinary least squares (OLS). While others, [53]

⁶(Zaidi, 2000, p. 160)

⁷(Securities and Exchange Commission of Pakistan, 2010)

⁸(Berg & Lewer, 2007, p. 34)

used cointegration analysis to the long term relationship between insurance and economic growth. Similarly, [54] used cointegration technique to check the long run relationship between trade and economic growth and to check the direction of causality, they used Granger causality. [55] used ARDL on annual data from 1970 to 2005 to capture the long and short term relationship between trade balance and its determinants.

We will use the amount of current US \$ GDP to measure GDP, amount of current US \$ imports/ exports to measure the international trade activities and to measure the insurance activity, we will use insurance industry/marine premiums from time period of 1996 to 2009. [6; 53; and 47] used the insurance premiums to measure insurance activity and GDP as economic activity so we followed the same approach to measure the GDP, international trade, marine insurance and cost of marine insurance in Pakistan.

$$G_{GDP} = \alpha_0 + \alpha_2 \text{Log} - FDI + \alpha_3 \text{log} - \text{openness} + \alpha_4 \quad (1)$$

$\text{log} - \text{insur pre} + U..$

GGDP = Growth rate of Gross Domestic Product

FDI = Foreign Direct Investment

Trade Openness = (Exports + Imports) / GDP

Insur Pre = Insurance premiums

Equation (1) has been used to measure the impact of FDI, Trade Openness and Non-life Insurance premiums on dependent variable of Growth rate of GDP. While Equation (2) has been used to measure the impact of Exchange Rate, Inflation and Marine Insurance premiums on dependent variable of Trade Openness. All the variables are taken in the Logged form.

$$\text{Log}_{Openness} = \alpha_0 + \alpha_2 \text{Log}_{Mar pre} + \alpha_3 \text{Log}_{Exc} + \alpha_4 \text{Log}_{inf} + U.. \quad (2)$$

Openness = (Exports + Imports) / GDP

Mar Pre = Marine Premiums

Exc = Exchange Rate

Inf = Inflation measured by CPI

While several authors i.e. [27; and 56] used trade openness (Exports + imports) to measure international trade. The regression equation given in 1.1 known as augmented source of growth equation because it also includes trade and Z variable to better capture the variation in output that would otherwise be captured by the error term.

Statistical Tests: To check the impact of trade openness, general insurance industry and foreign direct investment on economic growth; ordinary least squared (OLS) test is used. While Granger Casualty, is used to check the direction of relationship. In addition to this, Auto Regressive Distributed Lagged Model (ARDL) is used to check the long-term relationship between trade openness, general insurance, FDI and trade openness. As the dependent variable regressed by its own lagged value so it is known as Auto Regressive Distributed lagged test. First step in ARDL model is calculating the F-value and comparing it with the critical value given by Pesaran *et al* (2001)⁹. If the f-value is greater than the critical value then there exists a long-term relationship and vice versa [57]. Moreover, the value of dependent variable itself as independent (Growth rate of GDP) must be significant and negative in sign otherwise ARDL's results are not valid.

To check the impact of marine insurance, exchange rate and inflation on trade openness; ordinary least squared (OLS) test is used. While Granger Casualty, is used to check the direction of relationship. In addition to this, Vector Error Correction Model (VECM) is used to check the long-term relationship between marine insurance, exchange rate, inflation and trade openness.

RESULTS AND DISCUSSION

First, all the variables were tested for unit-root using the Augmented Dickey-Fuller unit-root test. Growth rate of GDP is stationary at level while Log of FDI, Openness and Non-life Industry premiums are stationary at first difference.

Given table shows, the results obtained from the execution of ARDL (Auto regressive Distributed lag) model. Dependent variable is the GDP growth rate. Log-open, Log-Insd and Log-FDI are representing the difference value of trade openness, Non-Life Insurance and Foreign Direct investment respectively. -1 and -2 are the values for first and second lag respectively.

The result shows that *F-value* (5.14, see Appendix A 2) is greater than the upper bound (5.11) limit given by Pesaran *et al* (2001, See Appendix A 4) and *p-value* (0.0004) is significant, which confirmed that there exists a long-term relationship among GDP, Insurance industry, openness and FDI for the period under study. Openness significantly ($p=0.009$, $t\text{-value} -3.17$) effects the growth

⁹See Appendix A 1. Error! Main Document Only. Pesaren Et aL (2001)

Table 2.2: ARDL

Full Name	Particular	Coefficient	T-Value	P-Value
	Constant	12.24670	4.291940	0.0011
Level lagged of Trade Openness	Log-open(-1)	-60.29070	-3.174493	0.0099
Level lagged of Insurance	Log-Insd(-1)	49.43897	2.733015	0.0211
Level lagged of Foreign Direct Investment	Log-FDI(-1)	11.48903	2.058262	0.0666
Level lagged of Gross Domestic Product	GGDP(-1)	-2.026165	-4.480035	0.0012
Diff of 1 st lagged of Trade Openness	D_Log-open(-1)	38.89395	2.308176	0.0436
Diff of 1 st lagged of Insurance	D_Log-Insd(-1)	-30.87949	-1.998039	0.0736
Diff of 1 st lagged of Foreign Direct Investment	D_Log-FDI(-1)	-6.397156	-1.368960	0.2010
Diff of 1 st lagged of Gross Domestic Product	GGDP(-1)	0.769218	2.624192	0.0254
Diff of 2 nd lagged of Trade Openness	D_Log-open(-2)	16.20308	1.762387	0.1085
Diff of 2 nd lagged of Insurance	D_Log-Insd(-2)	-10.74574	-1.392998	0.1938
Diff of 2 nd lagged of Foreign Direct Investment	D_Log-FDI(-2)	-3.975020	-1.287479	0.2269
Diff of 2 nd lagged of Gross Domestic Product	GGDP(-2)	0.247120	1.491278	0.1667
F-Value	5.14			0.016
Chi Square	20.56			0.000
Durbin Watson	2.21			

rate of GDP but the direction is negative ($\beta = -60.29$) due to the reason that Pakistan's imports are more than exports and it exports raw material rather than the finished goods [4, 58]. Another reason of this negative relationship might be that Pakistan imports more of the consumer goods than the capital goods [15].

While non-life insurance industry significantly ($p=0.02$, t -value 2.73) effect the growth rate of GDP and the direction is positive ($\beta = 49.43$). Insurance not only hedges the risk of loss but also plays the role of financial intermediary, provides better pricing of risk and efficient allocation of resources in economy as well. Our results are inconsistent with the findings of [42] as they found no significant relationship between non-life insurance and economic growth for 43 European countries. On the other hand, role of financial intermediation of insurance sector just like bank and financial market has increase over the time. However, [5] found that non-life insurance significantly effects economic growth of developing countries, as Pakistan is a developing country so the results are consistent with the findings of other researchers as well i.e. [46, 47, 59, 60]. Similarly foreign direct investment is significant at 10 percent level ($p=0.06$, t -value 2.03) and positively effects growth of GDP.

Trade Openness and Cost of Marine Insurance (Ols):

First, the author, check the unit-root using the Augmented Dickey-Fuller unit-root test. After making all the variables stationary, now we can check how much all the independent variables

collectively (i.e. marine insurance, exchange rate and inflation) explains the dependent variable (trade openness).

$$\text{LogTO} = \alpha_0 + \alpha_2 \text{Log MI} + \alpha_3 \log \text{ER} + \alpha_4 \log \text{in} + U..$$

Given table shows, the results obtained from the execution of OLS (ordinary Least Square) model. Dependent variable is the 1st Difference of trade openness.

OLS is used to check how much marine insurance premiums, exchange rate and inflation collectively explain the dependent variable openness. The result indicates that all the independent variables i.e. marine insurance premiums, exchange rate and inflation measured by CPI explain 57% ($R^2 = 0.57$, see Appendix B 4) change in dependent variable openness. Marine insurance premium is significantly (P -value = 0.0001, T -value = -4.80) related with openness but in negative ($\beta = -0.66$) direction. One of the prominent reasons of this negative relationship is that Pakistan is unable to compete in international market due to high political instability, energy crisis and war on terror. Because of high risk, cost of insurance has gone up after the 9/11. Now companies charge higher insurance cost to hedge the risk, this becomes the part of product as well. Pakistan is less competitive over price in international market¹⁰. The trade imbalance in Pakistan has already caused a negative effect, plus the heavy cost of marine insurance due to the security and political issues have further deepened the problem¹¹.

¹⁰[22]

¹¹(Gunaratna & Iqbal, 2011)

Table 4.3: OLS

Particular	Coefficient	T-Value	P-Value
Log of Marine Insurance	-0.67	-4.80	0.000
Log of Exchange Rate	-0.58	-0.57	0.572
Log of Inflation	0.11	2.26	0.033
R^2		0.57	
Durbin Watson		2.85	

Given table shows, the results obtained from the execution of Granger Causality Test

Table 4.4: Granger Causality

Granger Causality Test	F-Value	P-Value
H:1 Log of Marine premiums does not Granger Cause Log of Trade Openness	0.17071	0.6833
H:2 Log of trade openness does not Granger Cause Log of Marine Premiums	1.20102	0.2845

The results indicate that foreign exchange rate does not significantly ($P\text{-value} = 0.5721$, $T\text{-value} = -0.570$) related with openness. While inflation (CPI) is significantly ($P\text{-value} = 0.0331$, $T\text{-value} = 2.26$) related with openness and in positive direction ($\beta = 0.11$).

After examining the relationship with OLS, it is very interesting if the granger causality test are carried out to see the causal effect of the two variables. For this purpose, *Granger Causality Test has been conducted, given in table 4.6 below*. Granger causality test is used to check that whether there exists a one-way relationship (insurance effecting trade openness) or bi-directional. The null hypothesis (H_0) is that marine insurance does not granger cause trade openness. The null hypothesis (H_1) is that trade openness does not granger cause marine insurance.

As the $p\text{-value}$ of Granger Causality is insignificant for both of the equations that highlights that we cannot accept the null hypothesis. The alternate hypothesis is that there exist bi-directional relationship between marine insurance and openness.

In order to see the long term and short term relationship between trade openness and marine insurance premiums, we need to see the number of lags that effect their relationship. Therefore, by using various lag selection information criterion shown in table we conclude that at-least one lag has a significant impact on the endogenous variables. Further in order to see if the appropriate model to be used is a VAR and VECM co-integration test was conducted showing that variables are co-integrated at first lag therefore, we apply VECM, whose results are given below. For this purpose it is necessary that if variables are co-integrated or otherwise.

The result indicates *one* co-integration equation. Since variables are co-integrated, so we can run Vector Error Correction model. Out of five lags selection criteria three indicates *one* lags should be used while remain two criteria agree to use *two* lags (*see Appendix B 2*). The author used the one lags as majority (three) of the lags selection methods are agree to use one lags.

Given table shows, the results obtained from the execution of VECM (Vector Error Correction) model. Dependent variable is the 1st Difference of trade openness and D_Log-Insd representing the difference value of Marine Insurance. D(LGOPEND1(-1)) and D(LOGRMAND1(-1)) representing the 1st Lag of difference value of Trade Openness and Marine Insurance respectively.

After checking the co-integration and lags, Vector Error Correction Model (*see Appendix B 1*) was used to check the long-term and short-term relationship between openness and marine insurance. Result shows that independent variable explain 65% ($R^2 = 0.65$) change in dependent variable openness and ($F\text{-value} = 13.55$) shows the overall model fitness and is significant at ($p\text{-value} = 0.000038$). C (1) is the error correction term (speed of adjustment toward equilibrium) of the co-integration mention above in italic form. There exists a long-term relationship among trade openness and marine insurance premiums, as the value of C (1) is significant with negative coefficient. The speed of adjustment is 150% towards long run equilibrium, which is very quick. The others C (2), C (3) and C (4) are short run coefficient (*see appendix, B 3*). The results of Wald-test indicate that ($p\text{-value} = 0.004$, $F\text{-Value} = 5.37$) C (2) and C (3)

Given table shows, the results obtained from the execution of VECM (Vector Error Correction) model. Dependent variable is the 1st Difference of trade openness and *D_Log-Insd* representing the difference value of Marine Insurance. *D(LGOPEND1(-1))* and *D(LOGRMAND1(-1))* representing the 1st Lag of difference value of Trade Openness and Marine Insurance respectively.

$$D(LGOPEND1) = C(1)*(LGOPEND1(-1) - 0.0303034422797*LOGRMAND1(-1) - 0.0580505284014) + C(2)*D(LGOPEND1(-1)) + C(3)*D(LOGRMAND1(-1)) + C(4)$$

Table 4.6: VECM

Particular	Coefficient	T-Value	P-Value
C(1)	-1.509202	-5.886971	0.000
D(LGOPEND1(-1))	0.537867	2.91989	0.008
D(LOGRMAND1(-1))	-0.068909	-2.32702	0.030
Constant	0.001999	0.38352	0.705
R2	0.65		
F-Value	13.55		
Pro(F-value)	0.000		
Walt Test			
F-Value	5.37		
P-value	0.004		

jointly effects the dependent variable openness, which means there exists a short-term relationship among openness and marine premiums as well.

CONCLUSION

This study explores the long-term and short-term relationship of non-life insurance industry and marine insurance in promoting economic growth and trade openness respectively in Pakistan through Vector Error Correction and Auto Regressive Distributed Lagged Models. Furthermore, Ordinary Least Square model used to check the impact of marine premiums, exchange rate and inflation on trade openness and Granger Causality is applied to check the direction of relationship between marine premiums and trade openness. The results of ARDL model reveal that non-life insurance industry also plays a vital role in promoting economic growth just like banks and stock market. There exists a positive long-term relationship between general insurance industry and economic growth for the period under study. However, trade openness is negatively related with economic growth in the longer run for the period under study. The reason behind this negative relation can be explained in term of greater imports than exports in Pakistan and most of country's imports are consumer goods rather than capital ones. In addition, one of the main reasons for negative relationship between trade openness and Economic growth is that high marine insurance increases the cost of trade that ultimately effects the trade openness

negatively. Foreign direct investment is also positively related with economic growth in the longer run.

The results of OLS model reveal that marine insurance, exchange rate and inflation CPI collectively explain the dependent variable by 57%. The results of the test are in accordance with the theory, for instance, as the risk increases the premium charged by insurance company also increases, which added up into the cost of product making it more costly. It reduces the overall trade among countries. However, fluctuation in exchange rate is insignificant.

Moreover, the results of Vector Error Correction model reveal that there exists negative long-term as well as short-term relationship between marine insurance and trade openness. Due to high risk, insurance companies charge higher premiums, which make Pakistani goods more expensive over other country's products. Therefore, effecting trade in negative way¹². In addition, the relationship between marine insurance and trade openness is bi-directional in nature. Future researchers can perform similar analysis on the panel data of developing countries.

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¹²(Gunaratna & Iqbal, 2011)

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