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CAUSALITY RELATIONSHIP BETWEEN INSURANCE DEVELOPMENT AND ECONOMIC GROWTH – THE CASE OF TURKEY

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ÖZET

Yüksek Lisans Tezi

Türkiye'deki Sigorta Gelişimi ve Ekonomik Büyüme arasındaki Nedensel İlişki

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Son zamanlarda yapılan çalışmalarda, Sigorta-Büyüme ilişkisine dair güçlü kanıtlar bulunmuştur, ancak nedenselliğin yönüyle alakalı bu kanıtlar, araştırılan bölge ve zamana, uygulanan araştırma yöntemlerine göre çeşitlilik göstermektedir. Bu çalışma Türkiye'de 1998-2015 yılları arasındaki verileri kullanarak sigorta gelişimi ve ekonomik büyüme arasındaki ilişkiye ek olarak, sigorta ve bankacılığın gelişimi arasındaki ilişkiyi, hayat ve hayat dışı sigortayı ayrı ayrı ele alarak ampirik (görgül) olarak incelemektedir. Bu görgül araştırmada çeşitli büyüme, sigorta ve bankacılık değişkenleri kullanılarak birim kök testleri ve Granger nedensellik testi uygulanmıştır. Zayıf kanıtlara ve sadece ikincisinin ekonomik büyümeyi artırıcı görünmesine karşın, temel sonuç, hayat dışı sigorta ve hayat sigortası sektörleri sermaye birikimini artırmaktadır. Dahası, hayat sigortası gelişimi ve sigortacı ve reasürörlerin artan yatırım aktiviteleri bankacılığın gelişmesine katkı sağlamaktadır. Diğer taraftan, hızlandırılmış sermaye oluşumu ve ekonomik büyüme, sigortacıların ve reasürörlerin yatırım aktivitelerinin artmasına neden olmuştur. Bu bulgular, özellikle Türkiye için Sigorta-Büyüme ilişkisine dair önceden yapılmış çalışmalara ek kanıtlar sunmakta ve gelecekteki çalışmalar için yararlı olacak görüşler belirtmektedir.

Anahtar Kelimeler: Sigorta, Ekonomik Büyüme, Granger Nedensellik, Türkiye

ABSTRACT

Master's Thesis

Causality Relationship between Insurance Development and Economic Growth – The Case of Turkey

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Lately, plethora of studies finds strong evidence of Insurance-Growth nexus, however the evidences regarding the direction of causality vary according to the period and region investigated and research methodologies implemented. This paper examines empirically the relation between insurance development and economic growth, and additionally between insurance and banking development, separately for life and non-life insurance, in Turkey using time-series data for the period 1998-2015. Unit Root Tests and Granger Causality Tests are employed including various growth, insurance and banking variables in this empirical investigation. Although drawn on weak evidence, the main conclusion is that non-life and life insurance sector stimulate capital accumulation, albeit only the latter one appears as a prerequisite for stimulating economic growth. Moreover, life insurance development and augmented investment activity of insurers and reinsurers drive banking development. Conversely, accelerated capital creation and economic growth lead increased investment activity of insurers and reinsurers. These findings add on the previous empirical evidences regarding the Insurance-Growth causality, especially for Turkey, and provide additional insights that may be useful for future research.

Keywords: Insurance, Economic Growth, Granger Causality, Turkey

CAUSALITY RELATIONSHIP BETWEEN INSURANCE DEVELOPMENT AND ECONOMIC GROWTH – THE CASE OF TURKEY

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ABBREVATIONS

2SLS	Two Stage Least Squares
3SLS	Three Stage Least Squares
ADF	Augmented Dickey-Fuller
AIC	Akaike Information Criterion
AR	Autoregressive
BASSET	Ratio of Total Assets of Deposit Money Banks to GDP
BCRED	Ratio of Credit to Private Sector by Deposit Money Banks to GDP
CEE	Central-Eastern Europe
DF	Dickey-Fuller
ECM	Error Correction Model
EU	European Union
EUR	Euro
FDI	Foreign Direct Investments
GCF	Gross Capital Formation
GCFPC	Gross Capital Formation per Capita
GDP	Gross Domestic Product
GDPPC	Gross Domestic Product per Capita
GMM	Generalized Method of Moments
GWP	Gross Written Premium
INV	Ratio of Real Total Investments of Insurance Companies to GDP
LID	Life Insurance Density
LIP	Life Insurance Penetration Rate
LM	Lagrange Multiplier
MA	Moving Average
MTPL	Motor Third Party Liability
NLID	Non-Life Insurance Density
NLIP	Non-Life Insurance Penetration Rate
OECD	Organization for Economic Cooperation and Development
OLS	Ordinary Least Squares
PP	Phillips-Perron
SC	Schwarz Criterion
SEE	South-Eastern Europe

SURADF	Seemingly Unrelated Regressions Augmented Dickey-Fuller
T-Y	Toda and Yamamoto
UK	United Kingdom
USAID	United States Agency for International Development
VAR	Vector Autoregressive Model
VECM	Vector Error Correction Model

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INTRODUCTION

The relationship between insurance sector development and economic growth has received a lot of attention in the economic literature, especially during 2000s. While many researchers (e.g., Holsboer,1999; Liedtke, 2007; Brainard, 2008; Outreville, 2013) had argued about the relationship between insurance development and growth, novelties in the technologies and data availability for a large number of countries in the late 1990s initiated the increasing empirical investigation on the subject. The interconnection between insurance activity and economic development cannot be questioned anymore since the number of studies providing evidence on this issue is growing. Since insurance-growth nexus seems to exist, the following question that arises is the direction of causality or as Patrick (1966) then promoted the view that the relationship between financial intermediation and economic growth could be either supply leading, indicating that a augmented financial sector capacity and activity induces economic growth, or demand-following, meaning economic growth leads to greater financial activity because there is a larger demand for it as the economy flourishes. A third view supports bi-directional causality between financial development and economic growth.

Insurance sector, both as financial intermediary and as provider of risk transfer and indemnification, may enforce economic growth by efficient risk management encouraging accumulation of new capital, and by mobilizing domestic savings into productive investments. This theoretical view is supported empirically by many studies.[1] On the other hand, the demand-driven side of insurance is generally examined by taking a variant of current GDP or GDP per capita as a measure for the personal disposable income. Theoretically, greater income should increase the demand for insurance for several reasons, including richer offer of insurance products by insurance companies, increasing awareness to safeguard the potential income and expected consumption of the dependents against the premature death of the wage earner, and decreasing price of insurance products. Additionally, the growth of Gross Domestic Product (GDP) could trigger other socio-economic, demographic and other developments which may positively affect the

[1]Arena 2008; Haiss and Sümegi, 2008; Vadlamannati, 2008; Ćurak et al., 2009; Han et al., 2010; Njegomir and Stojić, 2010; Ege and Saraç, 2011; Kjosevski, 2011; Chen et al., 2012; Oke, 2012; Akinlo and Apanisile, 2014.

demand for insurance. Correspondingly, great empirical evidence exists for this type of theoretical reasoning, too.[2]

Turkey has been chosen due to its characteristics that may clarify some issues regarding the finance-growth nexus. The growth model of Turkey lays on the principle of capital shortage whereas the savings are held low and financial markets at home are weak while it accepts larger access to investable funds from abroad and enhanced financial intermediation that has as a consequence powerful boost to domestic investments and growth. However, this exposed the country to increasing financial instability and economic fragility. As Bancivenga and Smith (1991) suggest financial institutions may affect the configuration of savings leading to positive boost to capital accumulation and then if the configuration of savings influences real growth rates, those institutions will tend to support growth. On the other hand, with its immense territory and large population, as well as its sustained high development rhythm, Turkey is an attractive destination for the international insurers which are still eyeing new acquisitions or planning to expand and strengthen their current presence on the market. Besides the inferior place of insurance in the financial sector predominated by banks, financial intermediation function of insurance in Turkey becomes increasingly important as the international know-how flows inside the insurance sector of Turkey and as the regulatory frameworks is getting aligned according to international standards.

The aim of this paper is to investigate the causality relation between insurance sector development and economic growth with empirical analysis taking only the case of Turkey. Hence, this study examines the current theoretical background and creates analytical framework for the relationship between insurance growth and economic growth and later, quantitatively to test this causality. Additionally, due to specific structure of the Turkish financial system and the theoretical support for existence of interaction between banking and insurance, this research investigates the causality relation between these two sectors, too. Concretely, the study covers the following specific objectives: Firstly, to consider theoretical background for the channels through which the insurance sector affects the economic growth; secondly, to give critical overview of the empirical literature for the methodologies used and results obtained; thirdly, to offer comparative and historical descriptive analysis of the insurance sector and its potential relationship

[2] Beenstock et al., 1988; Outreville 1990; Enz, 2000; Beck and Webb, 2003; Zhang and Zhu, 2008; Feyen et al., 2011; Chang and Lee, 2012; Christophersen and Jakubik, 2014; Petkovski and Kjosevski, 2014.

with growth in the Central Eastern (CEE) and South Eastern European (SEE) countries and Turkey; finally, to build a proper methodology and test the causality relation between insurance sector development and economic growth, and additionally, insurance-banking causality.

Although most of the studies covering this topic are cross-country studies that implement growth regressions, we emphasize the critics suggested by Durlauf and Quah (1999) and Brock and Durlauf (2001) about weaknesses of such regressions explained in the methodological part of this analysis. Consequently, we decide to examine the relationship between insurance and economic growth by employing granger causality test modified according to suggestions of Toda and Yamamoto (1995). This contributes to the previous studies conducted, especially for Turkey, by resolving the direction of causality and giving proper explanation for the possible reasons leading to such causality results. Furthermore, we undertake a preliminary exploration of the channel through which insurance development is linked to growth by including the gross capital formation per capita in our regressions as a measure for capital accumulation. Also, we experiment with other insurance and banking variables in order to clarify our conclusions.

The paper finds that both non-life and life insurance sector stimulate capital accumulation, although only the latter one appears as a prerequisite for stimulating economic growth. These findings are strongly consistent with the theory that suggests that the function of collecting and accumulating contractual savings is the main function of insurance (especially for life insurance), which positions insurers in their role as institutional investors, in which they have the function of allocation capital efficiently in the economy. The direction of causality changes if we take the investments of insurers and reinsurers on aggregated basis. Namely, economic growth and growing capital creation induce increasing investment activity of insurers and reinsurers. All of this presumes long-run relationship between economic development and insurance sector development. Data limitations restricted us regarding testing for joint significance of banking and insurance in stimulating economic growth, however we checked for the causality relation between banking and insurance during the observed period and found that life insurance development and augmented investment activity drive banking development. These conclusions, however, must be qualified. While we exhibit results suggesting that insurance development spur economic and banking development, the fact that the results are not fully consistent across all specifications may lead some to conclude that overall

insurance development matters for growth but it is difficult to identify the specific components of the sector most closely associated with economic growth.

The paper is organized as follows: Part I provides analysis of the theoretical channels through which insurance sector development supports economic growth. This part finishes with critical review of the empirical literature. Part II comprises comparative and historical descriptive analyses of CEE and SEE countries and Turkey. Part III describes research methodology, including the sources of data, econometric specification employed and measurement of our variables, also, discusses our empirical results. The last part is reserved for concluding remarks.

PART ONE

THE ROLE OF INSURANCE SECTOR IN ECONOMIC DEVELOPMENT: THEORETICAL BACKGROUND AND REVIEW OF THE EMPIRICAL LITERATURE

The financial system is complex throughout the world comprising many different types of institutions: banks, insurance companies, hedge funds, stock and bond markets, and so on – all of which are regulated. Securities buyers and sellers do not have full access to information. Individual who have funds available normally are not able to assess the creditworthiness of borrowers to whom they could lend their funds. The financial institutions are needed to resolve the problems caused by market imperfections. They are the bridge between surplus units and deficit units whereas they channel the funds between these units. Assuming absence of such financial institutions, the information and transaction costs of financial market transactions would be excessive (e.g., Mishkin, 2003; Madura, 2009). Insurance sector is a part of financial system in which the insurance companies play the main role. Insurance combines sufficient number of homogenous exposures into a group to make the losses predictable for the group as a whole, with that, reducing and eliminating the risk in the economy (Vaughan and Vaughan; 2008: 41). In fact, it plays a more fundamental role in the mechanisms of a modern society and enables some activities, for which its absence would render the financial risks too great for the relative benefit, to exist at all. As such, insurance is a key component of economic development and an important driver for growth.

The objective of this part is to give a detailed theoretical elaboration of the role of the insurance sector in one economy, especially focusing on channels through which potentially could influence on economic growth. The other half of this part will show the current empirical literature that examines the relationship between insurance sector development and economic growth and acknowledge the methodologies utilized, and results provided.

1.1. THE ROLE OF INSURANCE IN ECONOMIC DEVELOPMENT

Insurance serves as a key player in creating efficient and sustainable development of modern economies, by employing expertise that is unavailable elsewhere. Various indicators such as the number of employees, the assets under management, or insurance sector's contribution to the national GDP show the significance that insurance has in promoting economic growth. In the absence of insurance a lot of activities would not take place (The Geneva Association, 2011: 4). For instance, in the absence of insurance, losses in income due to death, disability, and other adverse events often results in significant declines in consumption and investment that can permanently adversely affect a poor family's prospects (Brainard, 2008: 5). However, the role of insurers is much broader than viewing insurers as simple mechanisms that indemnify the unfortunate few who suffer losses from the funds collected from many policyholders. Accordingly, Skipper (1997) states that there are seven channels through which insurance sector supports economic growth: (1) Promoting financial stability and reducing anxiety; (2) Substituting for government security programs; (3) Facilitating trade and commerce; (4) Mobilizing savings; (5) Enabling risk to be managed more efficiently; (6) Encouraging loss mitigation; and (7) Fostering a more efficient capital allocation. In the following section, all of these functions will be explained in details.

1.1.1. Promoting Financial Stability

This function of insurance sector can be seen from two aspects: as a stabilizer of the financial situation of individuals, families and businesses, and as a key contributor in creating much sound financial system.

Firstly, insurers provide indemnification to ones who suffer a loss and reverse back the financial position of individuals and firms. Risk transfer to insurance companies enables risk adverse economic units to buy goods and services, especially those of higher values. Thus, demand or consumption for goods and services is underpinned by the insurance that later translates to increasing production and employment and finally, economic growth. Firms, by managing the risks of their liability, property, illness and disability of their employees focus their attention and resources to their core businesses (Ćurak et al., 2009: 32). Also, from

macro-perspective, insurance has buffer function in the modern economy. It indemnifies sudden plunges in financial needs linked to a disaster for all insured players. Insurance mechanism provides better planning, avoiding or mitigation specific risks that are considered to be threatening to the general business processes (Liedtke, 2007: 216).

Secondly, insurance has its social component. It enables families and businesses to remain financially stable in the face of hardships. Thus insurance, regarding some life insurance products, can help maintain a decent standard of living and quality of life after retirement. It prevents business disruptions that could result in bankruptcies, which in turn can lead to higher unemployment and economic hardship for employees. Additionally, the financial stability provided by insurance eliminates the risk of destitution if someone gets ill for any length of time or their house burns down.

Finally, insurance sector, as a key component of one financial system, could contribute in building more stable financial environment.[3] From a macro-prudential point of view, the core insurance business model does not create systemic risk[4] that is directly transmitted to the financial system. Insurance possesses several advantages comparing to banking, namely, lower contagion risk, higher substitutability and lower financial vulnerability. Since insurers strive to match expected future claims by policyholders with sufficient assets; this enables the transfer or run-off of their portfolios and improves the financial position of insurers (Insurance Europe, 2014: 7).

1.1.2. Public-Private Insurance Linkage

The state and private insurance sector could support each other in cutting the costs of the state social security programs and enabling the private insurance sector to accept risks that previously were considered as uninsurable due to lack of capacity.

The social security system throughout the world is under pressure due to the ongoing demographic situation of prolongation of life expectancy, greater number of

[3] Also see Liedtke, 2007: 216

[4] Systemic risk occurs when the flow of financial services is disrupted due to an impairment of all or parts of the financial system (Insurance Europe, 2014: 30).

elderly people and falling birth-rates, whereas people expect to receive a high level of healthcare and annuities (Ćurak et al., 2009: 32). Accordingly, private and social insurance could complement each other, and indeed the insurance sector can support states to provide security to citizens' while lessening their financial burden. Together with public policy measures – the insurance industry can provide its experience and know-how in risk management to provide complementary products and services and help create solutions to these difficult challenges (The Geneva Association, 2012: 11). Additionally, life, health, and payment protection insurance products can be substitutes for state social security programs.

On the other side, the state can act as a possible partner to insurance companies where this involves coverage for risks too unpredictable and/or costly for private insurance to cover alone, such as terrorism, nuclear disasters, mega events, earthquakes, volcanic eruptions and tsunamis. Examples are earthquake insurances (in Japan, Taiwan, Turkey and California), terrorism insurance programs (in US, France, Netherlands, etc.) or nuclear liability risk insurances (in most countries that operate nuclear power plants). Some governments purchase insurance to cover their immediate contingent liabilities arising from natural disasters. Privately insured part of the cover is defined and limited. States will always have two roles to play: to be insurer of last resort; or to project a risk profile that insurers can price and policy-holders can afford (Swiss Re, 2011: 1). By extending the capacity of private insurers, the state enforces additional premium production which could translate in higher economic growth, and provides a cushion in case of huge disaster.

1.1.3. Facilitating Trade and Commerce

Although, banking contributes the most in underpinning the trade and commerce through its lending and payment mechanisms, insurance indirectly supports the exchange of goods and services through some insurance products. For example, credit insurance helps banks to reduce its credit risk exposures and to promote higher levels of lending than would be the case in the absence of such insurance. Consequently, increasing lending would stimulate entrepreneurial activity and facilitate commercial transactions. Also, insurance enables business activity by enhancing the creditworthiness of customers. So, banks usually insist that loan collateral be insured. Life insurance products of the principal wage earner for

personal loans or of the lives of key employees with business loans are good example how insurance indirectly facilitates lending. By doing this, insurance indirectly assists in commerce development. Moreover, the availability of liability insurance enables many products and services to be produced and sold. Due to the high risk of new business failure, entrepreneurs will be eager to invest only if tangible assets and the entrepreneurs' lives are adequately insured (Skipper, 1997: 9). Most essentially, risk aversive individuals undertake elevated risk, higher return activities, promoting higher productivity and growth when insurance exists (Brainard, 2008: 1).

1.1.4. Mobilizing Savings

Primarily, Solow (1956) claims that financial sector development can stimulate saving and lead to a higher output per worker. Although there is increasing number of economists that generally agree for the positive relationship between saving rates and growth rates, but still there is no general acceptance as to the direction of causation. Insurance, from one side, increases the general savings rate (regarding the life insurance products) thus making deeper markets and stimulating more investments.[5] On the other side, it lures people to lower their level of unnecessary precautionary savings and channel their funds to investment and consumption. Consequently, the working capital in the economy is increasing because people do not have to protect themselves against the eventuality of, for example, their home being destroyed by some adverse event. They just have to buy insurance policy and be ready to pay a much lower amount of money over a longer period - a totally different mechanism. This means that the money saved can be channeled to other things, correspondingly, according to the preferences of the individuals. Insurance transforms dormant capital into free capital (Liedtke, 2007: 217).

On contrary, Ward and Zurbruegg (2000) argue that the insurance market development affects the saving rate and the availability of investment funds ambiguously. Namely, the portfolio diversification and availability of credit lead to a reduction of precautionary saving need by augmenting the accessibility to third parties' liquid funds. Similarly, since the risks such as death, retirement,

[5] Also see Skipper, 1997: 11; Beck and Webb, 2003: 1; Ćurak et al., 2009: 32

unemployment, loss of home and other can be transferred to insurance companies, insurance appear to discourage savings.

Moreover, Haiss and Sümegi (2006) discuss about the “saving substitution effect” of the insurance sector which is most evidently related to life insurance. The appearance of insurance companies as additional competitor on financial markets enables customers to diversify their portfolio or substitute their investments. Insurers provide products that combine protection, saving and investment components in order to attract new clients. Thus, the customer has possibility to shift his/her assets from one intermediary (for example, bank) to insurance company. Much concretely, the life insurance companies and pension funds could be considered as substitute saving vehicles that may lead to increasing competition in the investment and banking sector. However, a reduced need to save and a lower domestic saving rate could appear as a consequence.

Despite the ambiguity, the function of collecting and accumulating contractual savings appears as one of the main functions of insurance. This function positions insurers in their role as institutional investors, in which they have the function of allocation capital efficiently in the economy. In this role, insurance companies transform funds from small to large amounts and from short to long durations. This transformation function enables efficient allocation of capital in the economy, and is supported by the fact that insurers are better suited to apply risk selection and diversification in their investment portfolios than policy-holders are (Holsboer, 1999: 278). Additionally, the growth of debt and stock markets is supported by insurers through the mobilization of substantial funds through contractual savings products, which funds later are invested in bonds and stocks (USAID, 2006: 5).

1.1.5. Efficient Risk Management

The risk management function of insurance industry could be perceived from two perspectives: the insurance industry is a valuable source of risk management skills and information that benefit society as a whole; and the insurance mechanism, as a component of risk management concept, comprises risk pooling and reduction.

Aiming for proper decision making in the risk underwriting, insurance companies gather relevant information on risk factor and assess risk. Insurers’ risk

assessment is reflected in price and policy conditions. The pricing of insurance reveals the existence, frequency and extent of risks. By the help of insurance companies which enable pricing of the risks related with losses to businesses and others, insureds are able to quantify the severity and consequences of their risk-causing and risk-reduction activities and, thus, deal with risks on more rational way (Skipper, 1997: 13). Additionally, insurers supply firms with information about their risk profile that affects their decisions regarding investment projects and improves the process of efficient allocation of their resources (Ćurak et al., 2009: 32).

Furthermore, the insurance sector contributes by pursuing research related with risk management in various disciplines. Such research encourages many public debates on safety, leads to more risk-resilient behavior on behalf of consumers, and enforces broader and better legal standards such as improved safety performance requirements for cars, security systems for homes and businesses, building codes to protect against earthquakes etc. Taking into account that currently on the market variety of highly complex products can be found that require a lot of financial knowledge, insurers appear as a knowledge suppliers and training centers that help in understanding those products. Insurance companies as well need experienced and well prepared experts in risk management that employ them and so they have an interest in the education and formation of such workforce. Thus, they stimulate innovative knowledge relating with risk management, risk assessment and understanding vulnerabilities on the side of their potential customers, advising for example about risk exposures and prevention, loss mitigation strategies and appropriate solutions. This function of spreading knowledge is crucial not just for the insurance markets, but also for the general development of the economy because risk assessment, risk management, prevention mechanisms, and so on, can set the bases for sustained growth (Liedtke, 2007: 218).

Spreading the financial loss through risk pooling is the main principle in insurance. By accumulating many individual risk exposures, insurers utilize the law of large numbers to make reasonably accurate estimates about the pool's overall losses. As the number of insured units becomes larger, insurers' ability to predict their loss experience increases too, that enables them to charge a smaller risk premium for its risk transfer services and potentially to maintain much stable inflows (Skipper, 1997: 14). The premiums received are managed actively and because immediate cash withdrawals are not common in insurance operations, insurers can match assets and liability periods closely.

Additionally, Webb et al. (2002) state that due to lower cost of risk financing, insurers can boost the expected return on projects. Insurers are able to lower the costs due to their risk-pooling mechanism by identifying standardized risks and simplifying contracts, optimal investments and asset-liability management, valuable and cost effective administrative services regarding risk management and claims handling, and offering products that usually are tax-deductible expenses.

1.1.6. Loss Mitigation

Insurance mechanism enables people to plan with more certainty, avoiding or mitigating specific risks that might threaten commercial viability. Insurers have an important function in promoting awareness of risk, stimulating risk prevention and risk-adverse behavior, preventing economic losses. Primarily, prevention is the responsibility of the policy-holder. In many cases, insurance companies initiate risk resilient behavior by offering form of reduced premiums, which encourage the policy-holder to take beneficial preventive action (for example, lower policy price if no accident happened in the driving history of the insured). This confirms the notion that insureds and insurers work towards the common goal of risk mitigation, as insurers stimulates policy-holders' efforts to realize effective prevention in an increasingly complex environment (The Geneva Association, 2012: 12).

Besides creating incentives for ex-ante behavior, insurance promotes ex-post behavior. The information and knowledge that exist through insurance allow, for example, faster reconstruction after natural or man-made disaster. The existence of insurance enables people to work on possible disaster sites because the affected parties know that insurance policy will cover an event and ensure enough funds to sustain rebuilding efforts. In general, insurance fosters an industry around it: provides preventive measures and services, damage assessments, legal assistance, claims handling services, reconstruction mechanisms, etc. These activities reduce both direct and indirect losses to businesses and individuals and go together with good risk management that results in positive effect on society as whole.

1.1.7. Fostering More Efficient Capital Allocation

The financial sector contributes to the economic development by reducing the special transaction costs that originate from the asymmetric information in the relation between investor/borrower and saver/lender (Thiel, 2001: 14). Financial intermediaries join together the differences in interests between borrowers and lenders concerning the size of a financial investment, its maturity and risk. Accordingly, insurance companies collect funds from dispersed economic units who pay relatively small premiums and allocate these amassed funds to deficit economic units in order to finance large projects with that they achieve economies of scale that translates to lower transaction costs. Additionally, they collect and analyze information on borrowers, and with that, they help to individual savers, who are not able to gather and analyze such information due to lack of resources and ability, to resolve the problem of adverse selection. The access to relevant information, knowledge and lower costs of information processing enable insurers to select high-productive projects. On the other side, insurance companies have incentive to monitor managers of the firms to whom they lend their funds to provide high standards of corporate governance. Since insurers achieve economies of scale, they can realize these activities at lower costs than individual economic units and they can use their specialization in monitoring to effectively control their investments. In this way, ex-post information asymmetry and moral hazard are reduced, and this situation contributes to more efficient capital allocation (Ćurak et al., 2009: 33).

In addition, creation of liquidity appears as another function of insurers which occurs in the process of resources accumulation and their allocation. Accumulated funds are channeled towards long-term investments while at the same time instant liquidity is provided if loss occurs. Particularly important in providing long-term sources of financing are life insurance companies that offer contractual savings products. Life insurance companies can serve as institutional investors providing capital to infrastructure and other long-term investments as well as professional oversight to these investments because of the long term nature of their liabilities, considerable reserves, and predictable inflows. Accumulation of large amounts of reserves enables insurers to better diversify their portfolios. Also, the demand for liquidity in the form of cash and durable goods is reduced by life insurance products, and the composition of individuals' portfolio of savings is channeled to more

productive assets or as Webb et al. (2002) claims life insurance may alter the demand for liquidity from relatively unproductive assets (such as cash and jewelry) to more productive forms.

1.1.8. Other Channels of Influence on Economic Growth

All abovementioned functions could enable insurance to positively affect economic growth through other channels. For example, insurance allows entrepreneurs not to be distracted by the negative consequences of sudden events that might happen, and to concentrate on the commercial and financial challenges of their businesses. By reducing the exogenous risk, insurance underpins business growth and competition, frees up creative thought and fuels innovation. Accordingly, entrepreneurs are encouraged to invest in technological innovation as addition to their investments in present products and production processes. Additionally, insurers appear to be major employers, investors and tax contributors. The insurance sector contributes to the general employment in the world by directly employing millions of people and indirectly engaging even more through its distribution channels and administrative sectors such as agents, brokers, financial intermediaries, IT support, transportation, auditors and consultants. Thus, insurers by themselves, acting as competitive and innovative entities, contribute to economic growth, or as Liedtke (2007) states:

> *"An insurer is of course an entrepreneur. He is looking for new markets, for business models and strategies; he wants to grow, to establish client relationships, to create an operational infrastructure. He needs well-educated human capital and a sophisticated business infrastructure. All this leads to positive knock-on effects in other parts of the economy."*

Ćurak et al. (2009) offer additional channels of influence on economic growth. Financial innovations and insurance securitization gained pronounced role before the financial crisis. Theoretically, those might contribute to more efficient management of actuarial and financial risks in insurance companies, which could limit the leakage of resources. Also, novel insurance distribution channels like bancassurance can reduce the distribution costs and augment efficiency of transfer saving into investments.

1.1.9. Possible Negative Influence

Only few of the previous empirical studies (Kjosevski, 2011; Omoke, 2012; Zouhaier, 2014) partly[6] showed negative relationship between insurance sector development and economic development. On the other hand, there are few theoretical explanations about the negative influence of insurance on economic growth. Firstly, as Ward and Zurbruegg (2000) claim that it is important to fully grasp the problem of moral hazard, as a negative externality of insurance. Namely, the insurance mechanism could lure some insureds to behave more risky, which ultimately has, as a consequence, increased loss rate on accumulated productive capital. For example, Butler et al. (1998) accentuate that increased absenteeism and reduced levels of productivity in the economy appeared as a result of US workers' compensation insurance and sickness benefits. It is almost certain that insurance can at time result in negative rather than positive behavior. However, the discussions focus on opposing opinions on the correct balance between social welfare and personal responsibility, but neglect the positive contributions of each type of insurance and the fact that benefits are generally perceived to outweigh the negative consequences of moral hazard, even in contested areas such as healthcare. Secondly, insurers achieve diversification by accumulating large amount of funds, and with that lower the non-systematic risk. Diversification lowers the risk and that may translate to decreased motivation of individuals to save that may negatively affect economic growth. Finally, insurers through their indemnification mechanism create liquidity to individuals and businesses. Jappelli and Pagano (1994) argue that increasing supply of consumer credit and mortgage loans of financial intermediaries could enhance liquidity and that would create possibility of lowering the saving rate which in turn may result in slower economic growth.

[6] These authors included different indicators on disaggregated basis in their models and the results vary from positive to negative or no causation according to the indicator used.

1.2. EMPIRICAL LITERATURE REVIEW

In this part of the review of empirical literature regarding the relationship between insurance market activity and economic growth, we are trying to extend the scope of observation and consider researches that examined the linkage of these variables considering each direction of causation in order to clarify the endogeneity problem that may arise among variables. Frequently, in previous studies, the linkage between insurance market activity and economic growth was estimated by using panel data analysis and including various countries. Various researchers (King and Levine, 1993: 735; Levine et al., 2000: 63; Thiel, 2001: 45; Beck and Levine, 2002: 440; Rioja and Valev, 2004: 443) showed the importance of financial development in supporting economic growth, however, when research focus contains only the relationship between insurance and economic growth, the evidences fail to fully underpin the theoretical background. Accordingly, it is essential to consider the relationship between insurance and economic growth from both theoretical and empirical aspects. From a theoretical point of view, Patrick (1966) postulated that financial sector development could enhance economic development, or alternatively the growth in the economy brings about the development of financial activities. Consequently, two causation views are developed, supply-leading and demand-following. Supply-leading aspect covers the notion that financial development enhances economic growth by enabling efficient transfer of resources from traditional sectors to contemporary sectors and by empowering entrepreneurs to invest in these modern sectors. In contrast, the demand-following aspect implies that slow economic growth causes lack of demand for financial services that in turn holds the financial development down. Hence, as the real growth accelerates, investors and savers demand new financial services, leading to the creation of modern financial institutions, greater supply of their financial assets and liabilities, and related financial services.

1.2.1. Demand-Following Evidences

In general, in those studies where the demand-following aspect of insurance-growth nexus is examined, proxies for insurance sector development have been taken as dependent variables and regressed on different economic, financial,

demographic and institutional variables. Similarly, most of the studies comprised panel data analysis with specific study-related modifications. In his theoretical study, Brainard (2008) stated that prior to acknowledging the positive contribution of insurance to growth, it is crucial to understand in turn the facilitating factors that contribute to the development of a healthy insurance sector. Accordingly, large empirical evidence stresses the importance of rising incomes, macroeconomic stability, and financial deepening in promoting insurance market growth, against the environment of advantageous regulatory and supervisory framework.

In two different national studies (Adams et al., 2009; Yıldırım, 2015), the interrelation between insurance sector development and economic growth has been analyzed, using Granger Causality Test. Adams et al. (2009) examined the dynamic historical relation between banking, insurance and economic development in Sweden using time-series data from 1830 to 1998. They used logarithm of annual income per capita growth to measure economic growth and real annual value of total annual premiums (life and non-life insurance) per capita to measure insurance development. Also, due to the long time period covered, they divided the time series into three distinct sub-periods. The results of full-period analysis indicate that the banking sector development and economic growth together cause the demand for insurance probably as insurance provides protection for unpredicted asset losses after loans have been granted. However, this result should be considered carefully due to structural changes in Granger causality historical time series analysis. Similarly, for the years 1830-1888 the growth of banking services and economic activity induce increase in the demand for insurance. They concluded that the insurance market appears to be driven more by the pace of growth in the economy rather than leading economic development. Additionally, the demand-following insurance was confirmed in the study of insurance-growth nexus in Turkey, also by implementing Granger Causality Test and Vector autoregressive (VAR) Model (Yıldırım, 2015: 6). The analysis was made by using trimester data for the period 2006-2014 where GDP was taken as a proxy for economic development and total, life and non-life premiums as proxies for insurance sector development. The author found that insurance development does not Granger cause economic development, and that there is only one-directional causation from economic development towards insurance sector development. The selection of indicators and short period length might be the reasons for such results and requires caution in their interpretation.

Regarding the panel data analysis, researchers implementing such econometric tools successfully found stronger evidence vis-à-vis demand following insurance. Some of the researchers, taking into account that each segment of insurance (life or non-life) has specific characteristics and might be influenced by different factors, concentrated their research towards only one insurance sector, either life or non-life. For example, Beck and Webb (2003) and Chang and Lee (2012) analyzed variety of factors that might affect life insurance development, including them as explanatory or control variables in their regressions. Beck and Webb (2003) tried to find what drives the large variance in life insurance consumption across countries, using a panel with data aggregated at different frequencies for 68 countries over the period 1961-2000. They used four indicators as a measure for life insurance development (life insurance penetration, life insurance density, life insurance in private savings and life insurance in force to GDP), including each of them as dependent variable in combined regressions. On the right-hand side of their regressions, they included various economic, demographic and institutional variables. Additionally, the authors incorporated instrumental variables, proxies for banking sector development and schooling, in order to check reversed causation and simultaneity bias. In the end, they concluded that income per capita, inflation, and banking were the most robust predictors of life insurance consumption. Also, Chang and Lee (2012) investigated the link between economic development and life insurance market activities, considering 92 countries during the period 1996-2008. By applying a novel threshold model with the instrumental variable approach, where life insurance penetration or density appear as a dependent variable, and real GDP per capita combined with different economic, demographic and institutional variables comprise the explanatory mix, stated that real income level is positively associated with life insurance development. Additionally, they showed non-linear pattern that exists between real GDP per capita and life insurance penetration.[7]

Other authors considered the non-life component of insurance development and its determinants (Beenstock et al., 1988; Outreville, 1990; Petkovski and Kjosevski, 2014). Firstly, Beenstock et al. (1988) pooled annual cross-section data from 12 industrialized countries over 1970-1981 in their econometric investigation in order to define the link between income and spending on property-liability insurance. They regressed real property-liability premium per capita on income per capita, real

[7] Also see Beenstock et al., 1988: 269

interest rate, and one period lag of real property-liability premium per capita. Although there was limited number of variables, they concluded that property-liability insurance is a superior good and is disproportionately represented in economic growth. Furthermore, Outreville (1990), in his empirical examination of the relationship between property-liability insurance and financial and economic development, employed cross-sectional analysis of 55 countries over the period. He took real property-liability premium per capita as dependent variable[8] and GDP per capita, price of insurance and proxy for financial development as explanatory variables. Additionally, this equation was also estimated using an instrumental variable estimation where the measures of financial development and dummies to account for the supply structure of the market are used as instruments. In general, he inferred that income and financial development affect demand for property-liability insurance, taking into account that demand may differ according to country-specific variables. More recent study about the non-life insurance and its determinants employed co-integration approach and dynamic ordinary least squares with extended explanatory set (Petkovski and Kjosevski, 2014). The data set was comprised of 16 countries in Central and South-Eastern Europe during the period 1992-2011. Non-life insurance premiums divided by GDP was taken as dependent variable and on the right-hand side of the equation there were economic (including GDP per capita), demographic and institutional variables. The authors concluded that higher GDP per capita, together with, higher level of vehicles, more open economy, higher population density and higher level of protection and enforcement of property rights would facilitate the demand of non-life insurance policies.

Some researchers explored the demand-following aspect of insurance by considering both types of insurance (life and non-life) on aggregated and disaggregated basis. From aspect of methodology employed, two studies (Feyen et al., 2011; Christophersen and Jakubik, 2014) utilized generalized method of moments (GMM) dynamic panel methodology. Christophersen and Jakubik (2014) considered gross written premiums for life and non-life insurance separately as dependent variable, however Feyen et al. (2011) included three indicators as dependent variable: life insurance penetration, non-life insurance penetration and the ratio of total assets of insurance companies to GDP. Regarding the explanatory set of variables, interest rate, unemployment rates and nominal GDP were considered for the first study, and sets of economic, demographic, social and

[8] Also see Beenstock et al., 1988: 264

cultural, and institutional and market structure variables were employed in the second study. Christophersen and Jakubik (2014) concluded that the economic growth was main driver for non-life gross written premium growth, life insurance premiums were affected by economic growth and labor market, and life insurance sector development was more sensitive to macro environment. On the other side, Feyen et al. (2011) found that both life and non-life insurance sectors were driven by income, inflation had detrimental effect on life insurance but positive on non-life, and that financial development was more important for life insurance development than it was for non-life insurance development. However, the data in the study of Christophersen and Jakubik (2014) was fairly aggregate that requires careful interpretation of the results.

Moreover, Zhang and Zhu (2008) examined the determinants of insurance development in China, including the premium volume, insurance density, and insurance penetration, as proxies, by using data for 225 cities. For the independent variables they introduced common variables for life and property such as total population, per capita GDP, wage level, private saving deposit, foreign direct investments (FDI), education attainment, telephone ownership, and Herfindahl index. In addition, such variables as investment in fixed assets and dwelling space per capita are special for non-life insurance, while social security expenditure, life expectancy, young and old dependency ratio special for life insurance. They run ordinary least squares (OLS) regressions separately for the whole sample and for three sub-samples in order to check the effect of the explanatory variables on the insurance industry in different areas. As a conclusion, they argued that GDP per capita, population, average wage per employee, savings, FDI and investments in fixed assets positively influenced the non-life insurance development. GDP per capita was the only variable that has significant influence on all three dependent proxies for life insurance development. They claimed that the increase in income would not serve as a pushing factor for insurance purchase unless the income reaches certain level. Likewise, this non-linearity pattern was analyzed by Enz (2000). In fact, Enz (2000), by introducing a logistic function that allows income elasticity to vary as the economy matures, estimated that elasticity looks to be "almost" one at income levels of US$300 and US$30000 per capita, but reaches its highest values at US$10000 for non-life and US$15000 for life insurance. However, this S-curve relation between insurance and economic growth[9] has its limitations. As

[9] Also see, USAID, 2006: 2

he stated, it is only a one-factor model, it neglects all factors influencing the demand for insurance other that real GDP per capita.

Table 1: Classification of the Empirical Studies according to the Findings and Methodology

Research methodology	Findings					
	Type of study	**Methods**	**Demand-following evidence**	**Supply-leading evidence**	**Bi-directional evidence**	**No causation or weak evidence**
	Cross-country study	OLS; 2SLS; 3SLS or other panel data analysis	Beenstock et al., 1988; Outreville 1990; Enz, 2000; Beck and Webb, 2003; Zhang and Zhu, 2008; Feyen et al., 2011; Chang and Lee, 2012; Petkovski and Kjosevski, 2014	Haiss and Sümegi, 2008; Ćurak et al., 2009; Njegomir and Stojić, 2010; Ege and Saraç, 2011; Akinlo and Apanisile, 2014;	Webb et al., 2002; Lee et al., 2013	Zouhaier, 2014;
		GMM dynamic panel	Feyen et al., 2011; Christophersen and Jakubik, 2014	Arena 2008; Han et al., 2010; Chen et al., 2012	-	-
		Co-integration; VECM; or Granger causality	-	-	Petrova, 2014	-
	National study	OLS; 2SLS; or 3SLS	-	Vadlamannati, 2008; Kjosevski, 2011; Oke, 2012	-	-
		GMM	-	-	-	-
		Co-integration; VECM; or Granger causality	Adams et al., 2009; Yıldırım, 2015	Boon, 2005; Kugler and Ofoghi, 2005; Vadlamannati, 2008; Oke, 2012	-	Ward and Zurbruegg, 2000; Sarioğlu and Taşpunar, 2011; Omoke, 2012; Chau et al., 2013

1.2.2. Supply-Leading Evidences

Lately, plenty of studies tried to examine the insurance sector role in promoting economic growth. The revised Solow-Swan neoclassical growth model, assuming a Cobb-Douglas production model, was extensively used in many studies that investigated the potential effects of financial development (including insurance) on growth (Outreville, 2013: 28). Additionally, they included variety of econometric techniques including Granger Causality tests, OLS, 2SLS, GMM, ECM and others.

Three national studies covered granger causality testing of the insurance-growth nexus (Boon, 2005; Kugler and Ofoghi, 2005; Oke, 2012). Boon (2005) tested the causality relation in Singapore economy during the period 1991-2002 by using bank loans, stock market capitalization value and insurance funds as financial indicators with real GDP per capita and real gross fixed capital formation per capita as growth indicators. His study confirmed the supply-leading view, namely, the insurance market and stock market (over the long term) tend to promote economic growth. However, deriving conclusions based on such aggregated data and limited financial indicators should be taken with caution. Moreover, Kugler and Ofoghi (2005) evaluated long-run relationship between insurance market size and economic growth for the United Kingdom by using disaggregated data. They used net written premium for each market (Long-Term insurance, Motor, Accident and health, liability, property, pecuniary loss, reinsurance and Marin, Aviation and Transport insurance) in insurance industry in the UK as the market size for that market. Real GDP was taken as a proxy for economic development. They provided evidence of strong exogeneity from insurance market size to economic growth for seven out of nine markets, while this was true just for three cases for GDP growth to insurance market size. In order to explore the effect of insurance sector development on Nigerian economic development, Oke (2012) implemented OLS and Granger Causality tests by using GDP as a proxy for economic development and number of insurance companies, life insurance premium, non-life insurance premium, total insurance investments as a proxies for insurance development. The findings revealed that insurance sector growth and development positively and significantly affect economic growth. In addition, the Granger Causality test revealed that the extent of influence that insurance sector growth had on economic growth was limited and not direct because of some cultural, attitudinal traits and values in

the country. Although, we should be careful in interpreting the results of regression in which linearity was assumed between number of insurance companies and economic growth and there was only one control variable (inflation).

In addition, another two national studies included econometric techniques such as OLS, Co-integration, Error Correction Model (ECM) or all together in examination of the economic significance of insurance sector (Vadlamannati, 2008; Kjosevski, 2011). Integrating all abovementioned econometric tools, Vadlamannati (2008) taking the period 1980-2006 in India explored the effects of insurance development and the reforms in that sector on economic growth. Growth of insurance penetration (life, non-life and total) was used as proxies of insurance sector development. The models utilized in this study were OLS, co-integration analysis and error correction models. The author proved the positive contribution of insurance sector to economic development and a long-run relation between the variables. On contrary, the reforms in the insurance sector did not affect economic activity. Moreover, in his study of insurance development and economic growth nexus, Kjosevski (2011) estimated standard growth equation using a dataset over the period of 1995-2010 for the Macedonian economy. He measured economic growth by the growth rate of GDP per capita and insurance development by annual insurance penetration data for non-life, life and total insurance. In his three regressions (for each type of insurance and altogether) included various control variables frequently used in previous studies. He argued that only non-life and total insurance positively affect economic growth, although the proxy for total insurance lacked significance and that life insurance sector negatively influenced economic growth. Other studies that successfully confirmed the supply-leading insurance thesis mainly were based on panel data analysis. Four of them incorporated generalized method of moments dynamic panel methodology (Arena 2008; Han et al., 2010; Chen et al., 2012; Akinlo and Apanisile, 2014). Arena (2008) tested whether there was a causal relationship between insurance market activity (life and non-life) and economic growth, by using GMM for dynamic models of panel data for 56 countries over the period 1976-2004. The dependent variable was the average rate of real per capita GDP growth and key explanatory variables were life and non-life insurance penetration. Additional control variables were introduced as control variables. The author found robust evidence that both life and non-life insurance premiums had positive and significant effect on economic growth. Also, in the case of life insurance, its impact on economic growth was driven by high-income

countries only, and on the other hand, in the case of non-life insurance, its impact was driven by both high-income and developing countries. Finally, the study did not find evidence of non-linear effects of insurance variables, which was contrary to the findings of Beenstock et al. (1988), Chang and Lee (2012), Enz (2000) and USAID (2006). However, the author warned that the latest result might be due to collinearity issues. By using the same econometric methodology, Han et al. (2010) investigated panel data set of 77 economies for the period 1994-2005. They regressed real per capita GDP growth on insurance density (aggregated and disaggregated), initial GDP per capita, human capital accumulation and one of the following control variables: inflation rate, trade balance, or gross fixed assets investment. Conclusions of this study were as follows: economic growth was positively influenced by insurance density; life insurance development had significant impact on economic growth only for developing countries; and non-life insurance was of great importance for economic growth in developing countries. In the following article, Chen et al. (2012) investigated the insurance-growth link by only considering the life line for 60 countries over the period 1976-2005. They employed two-step system GMM approach for dynamic models of panel data. They built two models: basic and extended. The extended model was the basic model with different (economic, financial, demographic, income and region sets) conditions added. In the basic model, they included logarithm of real per capita GDP as dependent variable, life insurance penetration or life insurance density as explanatory variable, and set of control variables. The findings of the basic model showed that economic growth rises due to an increase in the degree of life insurance development. According to the extended model, savings, real interest rate and social security may mitigate positive effect of life insurance density on economic growth. Moreover, increase in life insurance penetration promoted economic growth and the positive effect was enhanced in low-income countries, but reduced in middle income countries. In their study, Akinlo and Apanisile (2014) adopted endogenous growth model with a modified Cobb-Douglass production function in order to investigate insurance-growth nexus in sub-Saharan Africa (30 countries) over the period 1986-2011. Besides GMM, pooled OLS and fixed-effects model were employed in the estimation. The dependent variable in this study was the percentage growth of GDP, while the key independent variable was the gross premium income. Additionally, proxies for physical capital, human capital, inflation, interest rate and openness were included in the estimation as control variables. They showed that insurance

premium had positive and significant impact on economic growth in sub-Saharan Africa, although the insurance sector development proxy was statistically significant only in pooled OLS.

Moreover, regarding the panel data analysis studies (other than GMM), Haiss and Sümegi (2008) examined how insurance premiums and investments affect GDP per employee in Europe for the period 1992-2005 using a sample of 29 European countries. Insurance services positively influenced economic growth for most of the countries in the sample: namely, EU-15, Iceland, Norway and Switzerland. For the new EU Members the impact of non-life insurance was found to be especially significant. Also, Ćurak et al. (2009) adopted standard growth model using a panel data set consisting of 10 transition European Union member countries over the period of 1992-2007. They implemented OLS and 2SLS (two-stage least squares), using one-period lagged regressors in the second method. Economic growth was measured by the growth rate of GDP per capita, while three different insurance variables – life, non-life and total insurance penetration were introduced as explanatory variables. The right-hand side of the equation was completed by including control variables. According to their results insurance development promotes economic growth confirming in terms of life and non-life, as well as, total insurance, even after controlling for other determinants of economic growth and endogeneity. Also, they implied that banks and insurance companies' financial intermediation might be substitutes. Similarly, Njegomir and Stojić (2010) applied linear country specific fixed effects model for panel data that encompassed 5 countries of the ex-Yugoslavia region for the period 2004-2008. As a proxy for insurance market development, the ratio of gross written premium was introduced accompanied by other control variables on the right-hand side of the regression. Additionally, in order to assess the investment function of the insurance companies, they included technical reserves of both life and non-life insurance companies in the control set. In the end, they asserted that insurers as a providers of insurance coverage and indemnification had positive influence on economic growth. By the same reasoning, examining the insurance-growth nexus in 29 countries over the period 1999-2008, Ege and Saraç (2011) utilized the methodology of Ćurak et al. (2009) with the only difference in explanatory and control variables. In fact, the authors took the rate of increase in total insurance premium payments as only one insurance explanatory variable and much shorter set of control variables comprised of employment growth rate, openness ratio and the share of fixed capital investment

expenditure in GDP. After correction for heteroscedasticity, they concluded that all variables except the proxy for investments positively affect economic growth. However, the short period of examination, the aggregate level of the key explanatory variables and the limited number of control variables in the last two studies appear as weaknesses in drawing their conclusions.

1.2.3. Bi-directional or No Causation Evidence

Some of the authors conducted extensive analysis of the relationship between insurance sector development and economic growth, separately for life and non-life insurance, and they received various results. Hence, all studies that do not have strong demand-following or supply-leading evidence will be presented in this section of literature review.

Only few studies appeared to show some strong bi-directional evidence (Webb et al., 2002; Lee et al., 2013; Petrova, 2014). Webb et al. (2002) evaluated the effect of banking and insurance on the growth of capital and output on cross-country data of 55 countries over the period 1980-1996. The disaggregated insurance variables were used: life and non-life insurance penetration. Firstly, they utilized OLS estimation method, and later employed three stage least squares (3SLS) simultaneous estimation. The results of OLS estimation showed only positive impact of banking development on economic development, while insurance variables did not enter significantly. In the later stage, after assuming endogenous relationship between financial activity and economic growth, they found a one-directional relationship between banking and GDP growth, and a two-directional relationship between life insurance penetration and GDP growth. No link found between non-life insurance and economic growth in any direction. Additionally, Lee et al. (2013) applied the panel seemingly unrelated regressions augmented Dickey-Fuller (SURADF) test to investigate the stationarity of real life insurance premiums per capita and real GDP per capita for 41 countries within three levels of income covering 1979-2007. They suspected in the traditional panel unit-root tests in terms of bringing misleading inferences, and concluded that the variables in these countries were a mixture of I(0) and I(1) processes. Also, they found that the hypothesis of a long-run equilibrium relationship between real GDP and real life insurance premiums tend to hold after allowing for the heterogeneous country effect.

Finally, they determined that the life insurance market development and economic growth exhibit long-run and short-run bidirectional causalities. Finally, Petrova (2014) investigated the short and long-run relationship between insurance market activity and economic growth for a panel data set of 80 countries for the period 2001-2012, by implementing unit-root, co-integration and granger causality tests. The logarithms of the variables (real GDP and all types of premiums: life, non-life and total) were used throughout the whole analysis. Additionally, dummy was introduced in order to separate the countries according to their level of economic development. Regarding the causality analysis, the author pointed out that a bidirectional relationship existed for the majority of investigated cases. Though, in the developing countries economic growth granger causes the life insurance market activity and not vice versa. For the advanced economies both life and non-life insurance sectors were shown to engage with the economic growth in a double-sided relationship.

On contrary, there were studies that failed to establish link between insurance sector development and economic growth or provided very weak evidence in any direction. Three studies utilized co-integration and granger causality analysis. For example, Ward and Zurbruegg (2000) analyzed the causality between total real insurance premium and real GDP for 9 OECD countries over the 1961-1996 period. For two countries (Canada and Japan) the authors found that insurance market leads GDP and for Italy they found a bi-directional relationship. The findings for the other countries showed no causality. Results from the Error-Correction Model (ECM) showed similar results and adding Australia and France to the group of countries giving evidence for some kind of connection. Accordingly, they claimed that the influence of number of country specific factors, such as cultural, regulatory and legal environment, better financial intermediation and the moral hazard effect in insurance make the causal relationships between insurance and economic growth to vary across countries. In similar way, Sarioğlu and Taşpunar (2011) tried to provide an evidence of insurance market-economic growth-financial development nexus in Turkey over the period 1987-2006. As a standard measure for economic growth they took the growth rate of GDP, for banking sector development, the growth of the total assets of the banks and the deposit money banks, and for insurance market development, six independent variables: the ratio of total direct premium, life insurance total direct premium, non-life insurance total direct premium, financial assets of the insurance companies, security portfolio and

the amount of bond and common stocks of the insurance companies to GDP. By examining one-year lag, their analysis showed that only the growth of the ratio of the financial assets of the insurance companies to GDP was granger cause of the economic growth. However, in a two-year lag, they could not find any evidence of causality between the variables. In another one-country study, Chau et al. (2013) aimed to assess the short and long-term relationship between life and general insurance consumption and economic development in Malaysia over the period 1970-2012. They utilized co-integration, granger causality and co-integration rank tests with error reducing method of Vector Error Correction Method (VECM). Although, the co-integration analysis showed short-term relation between life insurance and economic growth, and long-term relation between general insurance and economic growth (lacking significance), the granger causality analysis failed to establish link between insurance market activity and economic development.

The following studies applied simple OLS, VECM or panel data analysis and none of these proved the link between insurance sector development and economic growth. For instance, the impact of insurance market activities on economic growth in Nigeria during the period 1970-2008 was examined by Omoke (2012). The researcher employed Johansen co-integration and vector error correction approach by introducing real GDP as dependent and insurance density, inflation and savings rate as explanatory variables. The author found that the insurance density did not show any significant positive relationship with the real GDP. However, the aggregated level of the variables and the limited number of control variables could be considered as weaknesses of this study. Furthermore, in order to verify the relationship insurance-growth, Zouhaier (2014) analyzed a set of data relating to 23 member countries of the OECD over the period 1990-2011. The researcher utilized static panel data model, took the growth rate of real GDP per capita, as dependent variable, insurance penetration (life, non-life or total) or insurance density (life, non-life or total), as explanatory variable, and controlled with proxies for openness, investments, monetary discipline and financial development. The estimation outcome showed that the total and life insurance penetration did not have an effect on economic growth, while the non-life insurance penetration was positively related to economic growth. Also, there was no link between the life insurance density and economic growth while total and non-life insurance density had a negative impact on economic growth for that group of countries. We could point out that causality in this

study was not resolved and other relationships between the variables were not considered.

Although, the theoretical background about insurance-growth nexus clearly shows the contribution of the insurance sector to economic stability and growth, empirical affirmation is difficult. Lately, the number of studies which examined this issue is increasing. Panel data analysis dominates over country-specific studies. However, Ward and Zurbruegg (2000) argued that country-specific approach helps the differences in culture and regulatory environments to be spotted and the confounding effects that may arise in cross-country finance-growth studies to be avoided. Regarding the methodologies in the country-specific studies, granger causality tests and OLS were frequently utilized econometric tools in verifying the role of insurance sector development in promoting economic growth. Given that there was only a small number of country-specific studies explicitly investigating the insurance-growth nexus and many unexploited econometric tools (for instance, 2SLS, 3SLS, GMM etc.) that were extensively used in the panel data studies, but not in those country-specific studies, that leaves enough space for further research.

PART TWO

CENTRAL EASTERN- AND SOUTH EASTERN-EUROPE AND TURKEY – COMPARATIVE AND HISTORICAL ANALYSIS

In this part we set the basis for empirical examination of insurance sector development and economic growth in Turkey, by conducting descriptive analyses of the Turkish insurance sector and its relationship with economic growth from comparative and historical perspective. Firstly, comparative analysis between selected regions and Turkey is presented, and then the Turkish insurance sector is examined, by observing the historical developments and current trends.

2.1. COMPARATIVE ANALYSIS

Initially, we need to define group of countries that will be included in the comparative analysis. In order to avoid selecting a biased sample of countries, we define wider set of countries that belong to two geographical regions: Central-eastern Europe[10] (CEE: Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovenia, and Slovakia) and South-eastern Europe (SEE: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Kosovo, Montenegro, Macedonia, Romania, and Serbia). Additionally, according to the available data, we expand the analysis by including total or average data of Eurozone 15.[11] Behind such classification lays the fact that the countries of CEE region are characterized with higher GDP per capita and higher development of the insurance sector comparing with the countries of SEE regions; while, the average GDP per capita of Eurozone-15 is the highest, and also its insurance sector development ranks as the most developed in the region. Turkey is on its way to EU integration, so it needs to pass through the phase of development that CEE countries are in now.

[10] Sometimes SEE countries are included in CEE region, however our modified grouping of countries is made intentionally in order differences in insurance developments of these regions to be seen much clearly.

[11] EU-15 comprises: Belgium, France, Italy, Luxembourg, Netherlands, Germany, Denmark, Ireland, United Kingdom, Greece, Spain, Portugal, Austria, Sweden, Finland.

2.1.1. Insurance Sector Development of CEE Countries, SEE Countries and Turkey

The European Union's economy returned to an ascendant path in 2014, in particularly helped by the depreciation of the single currency, which supported exporters, as well as by the falling oil prices, encouraging trade and household consumption. The European insurance industry benefited from this incipient recovery and achieved a 4.2% growth in Gross Written Premium (GWP), to EUR 1,176 billion, significantly higher than the 1.9% year over year increase in GWP reported in 2013. The best rate was reported for the life insurance segment (6.4%), while on the non-life side the European business volume remained rather stable, with a 1% upswing. Also, CEE and SEE economies saw a better 2015 as compared with the previous years. However, the citizens' purchasing power did not improve much, maintaining the insurance expenditure in a peripheral area of the family and corporate budgets. Thus, the mandatory component of the motor insurance segment continued to hold the largest share of the business volume. And most recently, the Solvency II framework went live on January 1, 2016. Mainly, this regulatory framework was designed to introduce a harmonized and robust prudential framework for insurers in the EU, and one that would lead to a much better understanding and alignment between the capital of an insurance company and the real risk embedded in the activities of that company. Consequently, all countries that are or strive to be member of EU should harmonize their laws according to Solvency II. That would lead to securing efficiency and stability of their insurance sectors, and supporting the integration process of these countries into the EU financial system. In this comparative analysis, the following indicators are taken as a measure for insurance development: insurance penetration, insurance density and the GWP growth rate. The movements of these indicators are presented in Figure 1.

Insurance penetration rate indicates the level of development of insurance sector in a country or region. It is measured as the ratio of premium underwritten in a particular year to the GDP. The average value of this indicator in the CEE and SEE regions is plummeting during the period 2012-2014, much abruptly in the CEE region (Figure 1-a). This result is mainly due to the decrease in premium production in Poland[12] which is the biggest market in this region and produces approximately

[12] This decrease was caused by the reduced sale of investment policies in class 1 of Life insurance within the last two years (Polish Insurance Association).

half of the CEE premium. These movements indicate divergence in the development of the insurance sectors of these regions from the development of the EU-15 insurance sector whose rate varies around 8%. The Slovenian insurance market is ranked as the most developed among the CEE and SEE countries, although with decreasing rate. When we observe the SEE insurance sectors' development, only Albania (0.83%) significantly is staying behind the development of other insurance markets in this region. Observing this indicator, Turkey is showing progress during 2012-2014 period, and is getting close to the average value of SEE region, although it is still behind compared to CEE countries. The insurance penetration rate of Turkey during the period 2012-2014 was 1.4%, 1.55%, and 1.47%, respectively. Similarly, the average insurance penetration rate of SEE region during the same period was 1.7%, 1.7%, and, 1.65%, respectively.

Another indicator that is generally taken as a measure for insurance development in one economy is the insurance density. This refers to per capita premium. Here, situation looks much alike as it was the case with the previous indicator, although the divergence between CEE market and Eurozone-15 market becomes much apparent (Figure 1-b). In the SEE region, Croatia distinctively leads comparing to other countries with per capita premium of 263.76 EUR in 2014, although during the period 2012-2014 experiences decreasing trend driven by the drop in motor third party liability (MTPL) premium.[13] Comparatively, Turkey's per capita premium surpasses that of the SEE region but it lags behind that of the CEE region. In 2014, Turkey's insurance density was 119.32 EUR which is approximately one third of the insurance density of CEE region. It is evident that the Turkish insurance sector is closer, regarding its development, to the SEE countries' insurance sectors that are still young and restricted by not well developed financial systems.

Additionally, the growth rates of the gross written premiums (GWP) may give some insights regarding the degree of development of each insurance sector. If we observe the CEE region, the Czech Republic and Slovakia were the only countries ending the first half of 2015 with a negative change in GWP, of 4.99% and 2.8%, respectively. In both cases the life insurance segment is entirely responsible for the negative trend. On the other side, Albania and Serbia recorded the best performance, both of them benefiting in a high degree from the MTPL line growth.

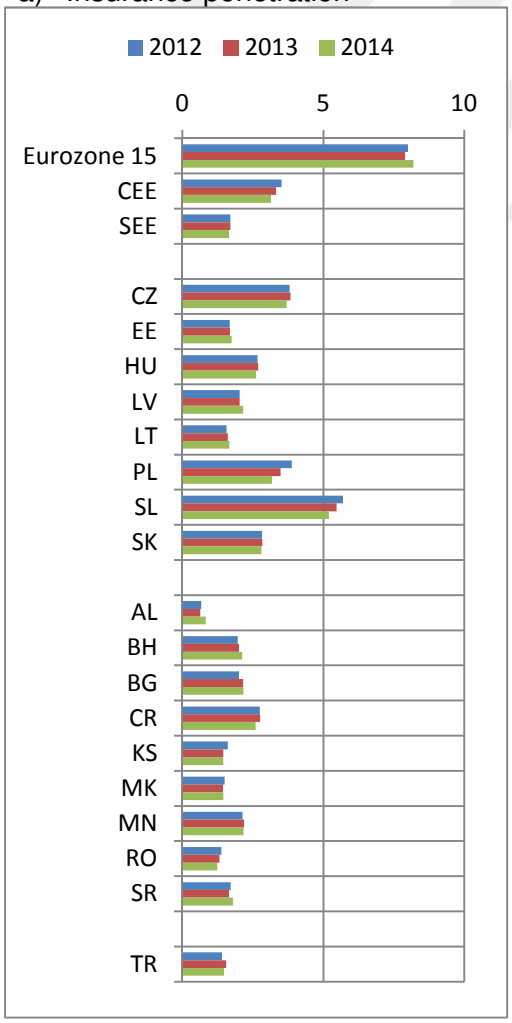
[13] The reason for this drop in the premiums is the harsh competition activated by the tariffs' liberalization.

Despite the challenging macroeconomic conditions driven by the falling oil price, the weakening currencies and last but not least the volatile political situation in the region, Turkey continued its constant growth although at somehow more modest rates, as compared with the previous periods. In the Turkish insurance market, the property lines including agriculture insurance recorded by far the best dynamics. Looking at Figure 1-c, we can see that the SEE countries and Turkey recorded higher GWP growth rates than the CEE countries did. This result is, mainly, because of lower initial development of these countries' insurance sectors, and the need for increasing development of their economies in general. Comparing with the CEE countries, whose insurance sectors are positioned at higher level of development and where the peak of the insurance development happened earlier, Turkey (9.57%) records GWP growth rate that is more than double of the growth rate that the CEE countries recorded.

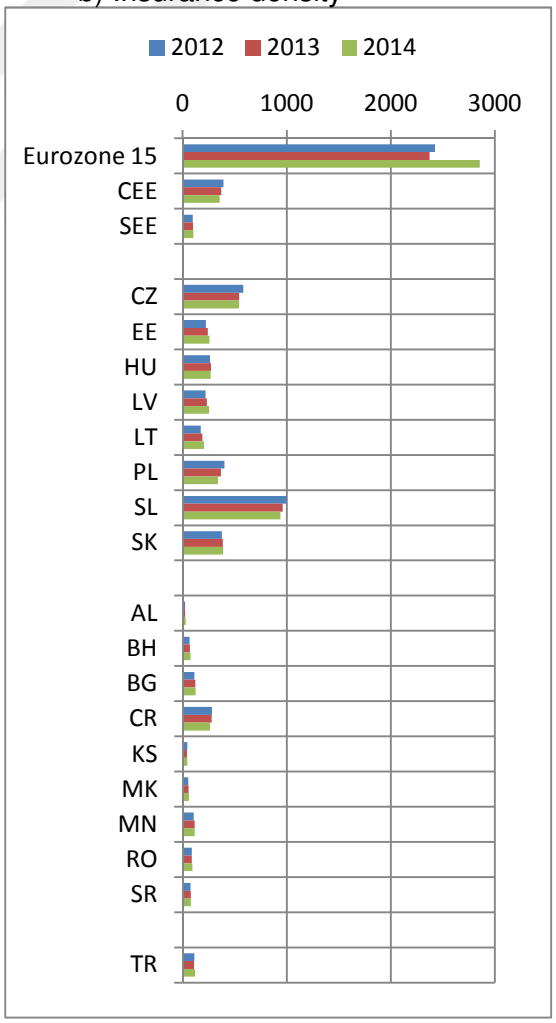
To clarify the differences between developed and less developed insurance markets, we should scrutinize the division of total GWP according to business lines. In general, developed insurance markets are predominated by life insurance due to well established pre-conditions for its development. Developed countries are characterized with higher income per capita that translates to higher person's consumption and human capital. Thus, assuming that life insurance products could be considered as luxury goods, higher disposable income may stimulate people to channel a larger part of their income to retirement and investment-related life insurance products. Conversely, insurance companies acquire human and information resources in order to effectively price the risks and satisfy the reserve requirements for products as well as adequate investment opportunities in financial markets. To achieve this well-organized and stable financial system arises as a basis for efficient investment activities. On contrary, less developed insurance sectors are predominated by compulsory insurance lines because of people's lower income and low awareness for the benefits that insurance mechanism offers. So, they understand the purchasing insurance policy as an obligation, not a necessity. Normally, MTPL insurance is mandatory in most of the countries, therefore the higher share of this business line indicates lower insurance development.

Figure 1: Indicators for the Development of the Insurance Sectors of CEE, SEE and Turkey

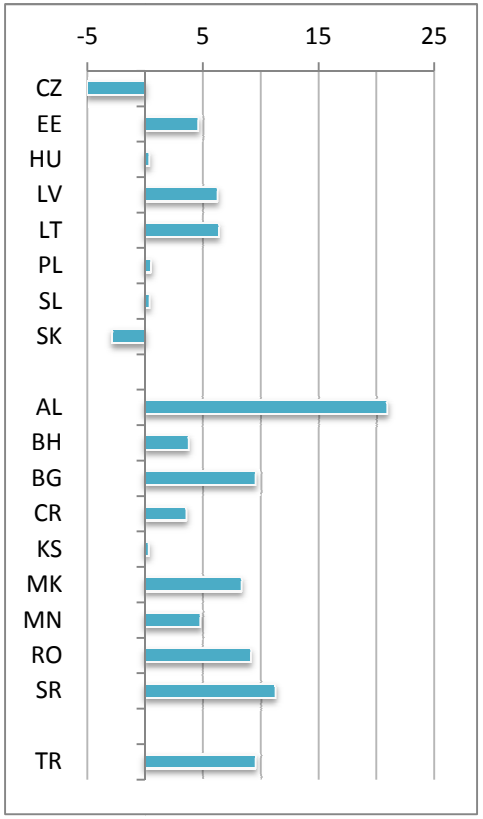
a) Insurance penetration



b) Insurance density



c) GWP growth rates (1H2015/1H2014)



Source: OECD; XPRIMM

Figure 2 presents the structure of total GWP for each country and region, according to types of insurance lines. As we can see, in the Eurozone 15 and CEE regions, life insurance sector takes the biggest share of the total GWP production that indicates higher level of insurance development. Differently, the SEE region is predominated by the MTPL insurance. Even if we observe each country individually, the same patterns become evident whereas the green line (life insurance) dominates in CEE countries while the red line (MTPL) dominates in SEE countries (Figure 2). The case of Turkey appears to be somewhere in between because neither life insurance nor MTPL takes the highest share of the total GWP. However, taking the fact that the mandatory earthquake insurance introduced in 1999 is included in the property insurance line, we could assume that the insurance imposed by law dictates the premium production in Turkey.

Figure 2: GWP Portfolio per Country and Region (1H2015)

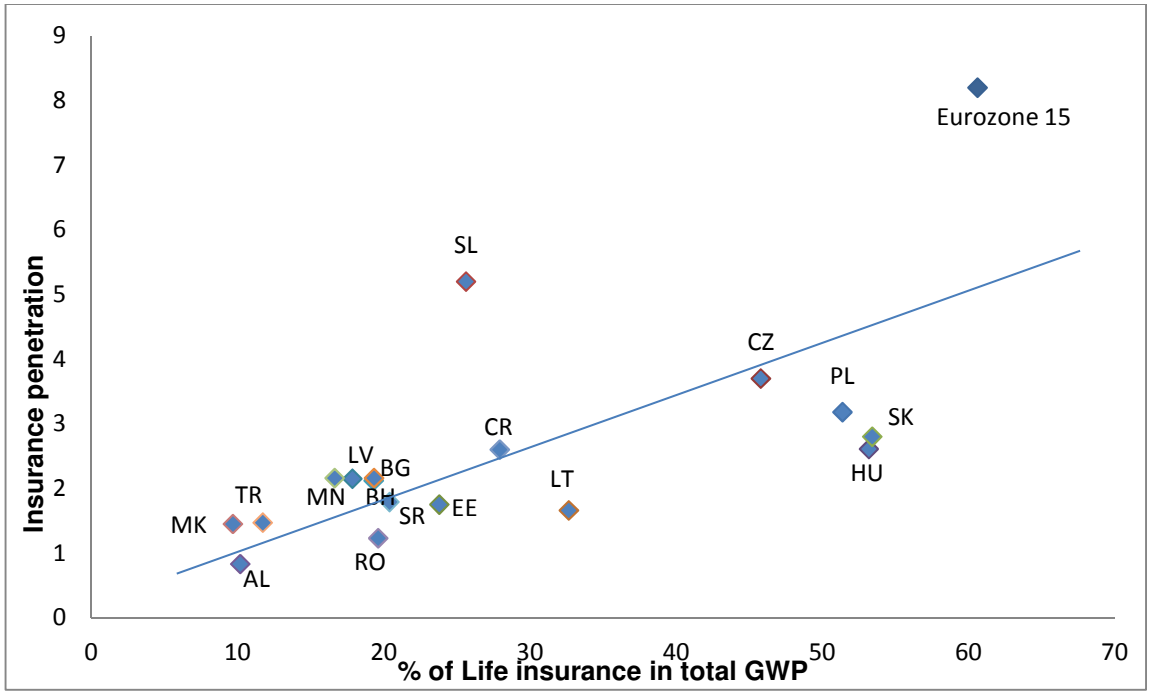
*data available only for life and non-life (aggregate) business lines in 2014

Source: XPRIMM

In 2014, the highest share of the Eurozone-15 GWP belongs to life insurance premiums (60.6%). From the CEE countries, Poland has the highest share of life insurance in total GWP (51.36%), while from the SEE countries, Croatia (32.41%). Kosovo, as a young country, has still underdeveloped insurance sector with predominant share of MTPL in the total GWP (67.69%). As we mentioned previously, Turkey's GWP production was driven mainly by property lines (27.13%), while life insurance premium share is 12.49%.

In order to show the positive relation between the level of insurance development and life insurance importance in the developed and underdeveloped insurance markets, on scatter diagram we plot the insurance penetration and the share of life insurance in total GWP of each country. It is evident that the markets with higher insurance penetration possess higher share of life insurance premium in total GWP. The correlation coefficient between these variables is 0.66. Figure 3 shows that Turkey, Macedonia and Albania have the lowest level of insurance development as well as inferior share of the life insurance in total GWP.

Figure 3: Insurance Penetration and the Share of Life Insurance in Total GWP (1H2015)



Source: XPRIMM

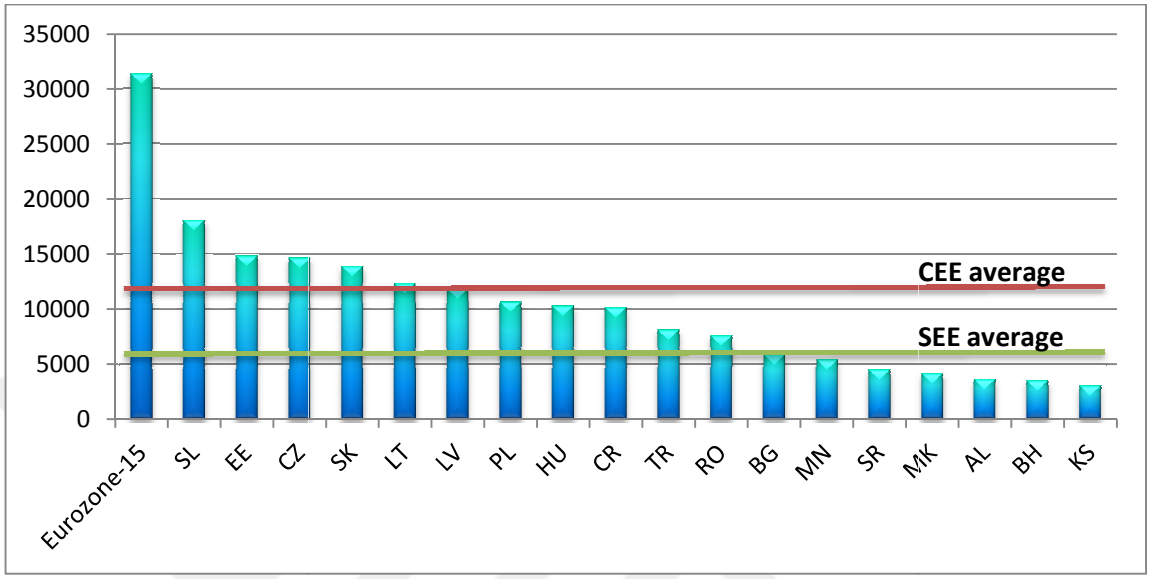
2.1.2. The Relationship between Insurance Sector Development and Economic Growth in CEE and SEE

On their way towards EU integration, the CEE and SEE countries should pass through the process of real convergence that implies that their GDP per capita and living standards ought to advance and get closer to those of EU. In figure 4, the countries are ranked according to their GDP per capita, denominated in euro, including the average value of EU-15. It can be noted that the average GDP per capita of the CEE region is higher than that of the SEE region. This implies that the first group of countries is closer to the real convergence towards EU, comparing to the second group. In the CEE group, Slovenia leads, with GDP per capita of 18071.26 EUR; the higher economic growth of this group of countries is associated with their higher initial base, as well as, the fact that they joined the EU.

On the other hand, the countries of SEE region significantly are lagging behind, with average GDP per capita (6211.35 EUR) that is approximately half of the CEE average (11805.9 EUR). Moreover, the countries of this region are much heterogeneous, only Bulgaria, Romania and Croatia are EU members, and others are (potential) candidate-countries. Increasing political instability is a common feature of the SEE countries. For most of these countries, the EU accession appears to be a distant future. However, regarding the convergence process and the changes in their insurance sectors, important restructurings occurred lately.

With GDP per capita of 8100.47 EUR, Turkey is placed in the middle between the CEE and SEE average. However, this number is only one fourth of the EU-15 average (31376.27 EUR) and it is good indicator of the current situation of the Turkish economy in the real convergence towards EU.

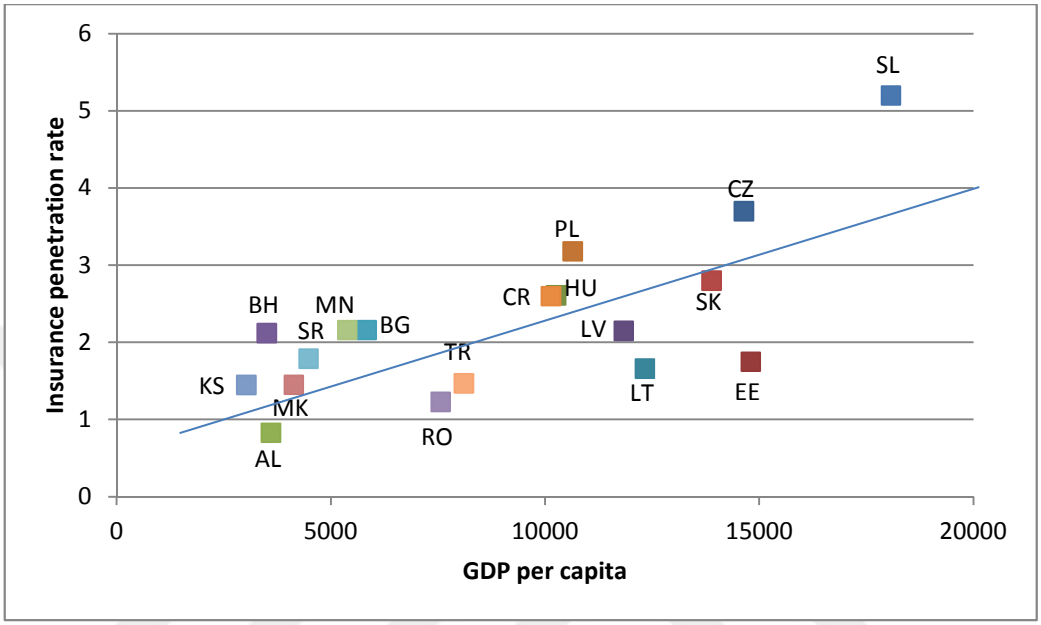
Figure 4: GDP per capita (EUR) in 2014



Source: XPRIMM, World Bank, Author's calculations

The potential relationship between insurance deepening and economic development could be observed by scatter-plotting the insurance penetration rate and GDP per capita of the abovementioned countries. Figure 5 shows the positive slope; the correlation coefficient between these variables is 70.3%; this may indicate a positive causal relationship between the insurance development and GDP per capita. Additionally, taking into account the level of development of the countries, we note that in the lower part of the figure 5 the SEE countries are concentrated (except Croatia), however as you move north-east, the CEE countries predominate. Turkey takes the central position, placed closer to the SEE countries. These observations should direct us towards the notion that higher insurance sector development may be associated with higher economic development.

Figure 5: The Relationship between Insurance Sector Development and Economic Development (2014)



Source: XPRIMM

As a conclusion, the comparative analysis points to that: 1) the development of the insurance sector of Turkey is, generally, around the average development of the SEE countries, but, significantly lags behind the averages of CEE and EU-15; 2) exist potential relationship between the degree of insurance deepening and economic growth.

2.2. HISTORICAL OVERVIEW OF TURKEY

2.2.1. Regulation, Structure and Current Trends of the Insurance Sector

Regardless of the numerous turbulent events that overwhelmed the Turkish economy's history, the major turning point towards creating pre-conditions for augmented financial deepening occurred in the post-1980 period.[14] The 1980 stabilization program paved the way for financial liberalization by including separate key

[14] See more in Akyüz and Boratav (2002); Boratav and Yeldan (2006).

reforms (such as substantial deregulation of the bank interest rates, creating competitive environment, liberalization of the foreign exchange regime etc.) that, later, facilitated much painful liberalization process, contrary to what was predicted. Since then, Turkey has gone through three crises: starting with the 1994 crisis, when sudden capital outflow resulted due to low domestic interest rate environment; later in 2001, when political crisis expanded the exchange-rate-based stabilization program was questioned that led to a massive withdrawal of funds; and finally in 2008 when US sub-prime mortgage crisis sparked and negative shocks pervaded throughout the world including Turkey (Rodrik, 2012: 44).

Although the earliest evidences of insurance transactions in Turkey date from 1870s, the real development of the insurance sector could be noted by observing the serious attempts to regulate this industry with proper legal framework. From that aspect, briefly, we concentrate on the main changes that happened in the regulation and organization of this sector, especially during the financial liberalization process. In 1987, several changes announced the line-up of the insurance sector towards increased stability and coordination. Firstly, new law titled as “Insurance Supervision Law” amended the previous regulation setup. Secondly, the authorization of regulation and supervision in insurance was taken from Ministry of Industry and Trade and given to Prime Ministry’s Undersecreteriat of Treasury. Thirdly, the Association of Insurance and Reinsurance Companies of Turkey was established by law and became a specialist institution with the characteristics of a unique non-governmental institution. Additionally, another important change was that foreign companies operating in Turkey became subject to same principles with Turkish companies, by incorporating or opening branches and reserving some amount of premium that are underwritten in the country. Meanwhile, besides the occasional adjustments in the laws, three important regulations expanded the insurance legislation. First one is Statutory Decree No. 587 regarding Compulsory Earthquake Insurance, dated 27.12.1999, which came into effect after 1999 earthquakes. The second one is Law No. 4632 Individual Pension Saving and Investment System which came into force on October 7th, 2001 with the aim of directing personal savings towards investments, based on voluntary and predetermined contributions; increasing welfare in retirement period; creating long-term resources for economy and increasing employment and economic development. The last one is Law No. 5363 Agricultural Insurance Law, dated 14.06.2005. The aim of this law is to

establish agricultural insurance for producers against losses specified in the law. Finally, the most important update occurred on 14 June 2007 when new Insurance Law came into force. The objective of this law is stated as setting the structure of insurance activities in a more systematic way, responding to the changing circumstances and needs, efficient functioning of the system in order to protect the rights and interests of the insured and harmonization of the regulation to the international standards.[15]

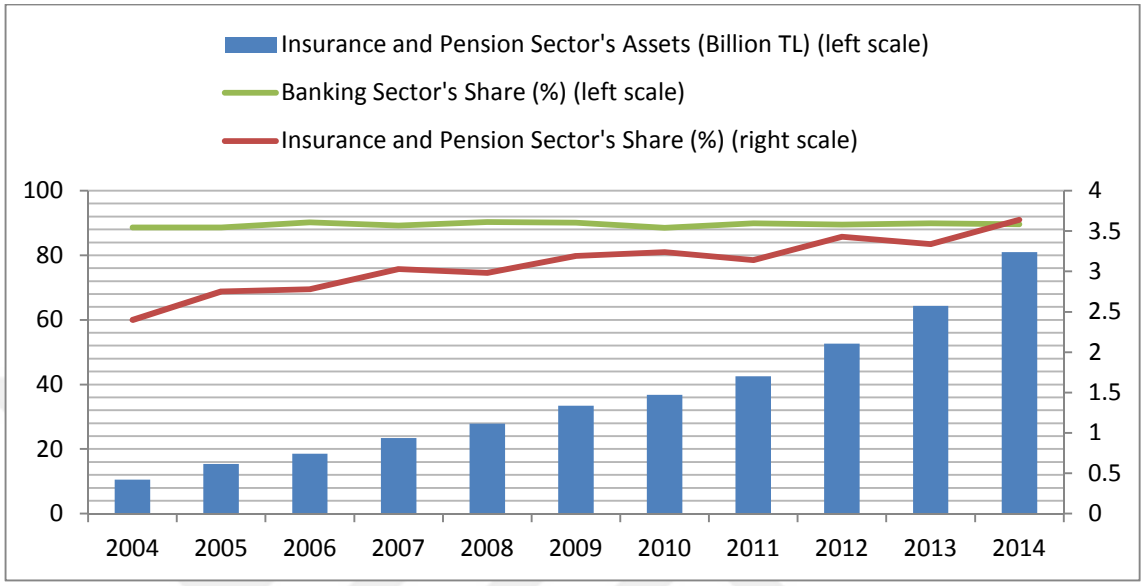
The main restructuring process in the insurance sector (and generally, in the financial system) started after the 2001 crisis. Departing from the negative events following the years after the crisis when the number of the insurance companies that went bankrupt was increasing, and concluding with the positive developments regarding the establishment of new institutions and proper legal framework for much sound insurance system, the stabilization of the insurance sector's structure was prominent as the Turkish economy was recovering after the crisis. However, the aim of this analysis is not investigating the restructuring process of the insurance sector in Turkey, thus we focus on the latest ten years, in order to grasp the current trends that shaped the insurance sector development.

The Turkish financial sector is still far from some heterogeneous structure whereas the banks hold dominant share (89.57%) of the total assets' pie, although with stagnant tendency. If we observe the period 2004-2014, the insurance and pension sector's assets are constantly increasing in absolute terms. The growing importance of this sector can be seen by the movement of their share in total financial sector's assets, in 2004 that was 2.4%, while in 2014 increased to 3.64%. Another indicator that confirms this trend is y-o-y growth of the insurance and pension sector's assets which on average equals to 22.67%, while that of the banking sector is 17.78%. However, to such increase mainly contributed the growth of the individual pension funds, not the growth of the insurance funds.

In the Turkish Insurance Sector as of 2014 year-end, there were 63 insurance, reinsurance and pension companies that actively operated. Out of 63 active companies, 38 were non-life insurance, 5 were life insurance and 19 were pension companies, and there was just one reinsurance company.

[15] Much broadly about the historical developments of the regulation of the insurance sector and its harmonization with the EU standards in Deligöz (2006).

Figure 6: Insurance and Pension Sector's Assets in Turkey

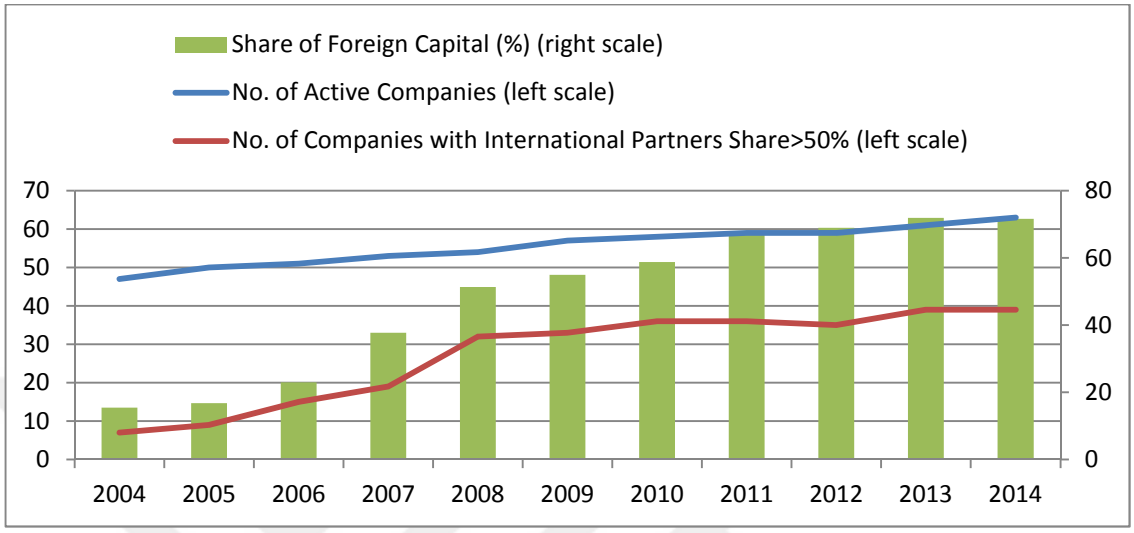


Source: Undersecreteriat of Treasury

The fact that the penetration rate is low and there is high growth potential continues to draw attention of foreign investors to the Turkish insurance market. In the Turkish Insurance Sector, 26 of 38 non-life insurance companies and 18 of 24 life and pension companies have international capital directly or indirectly. Looking historically during the last 10 years the share of the foreign capital is constantly increasing and culminates in 2013 achieving 71.94%.

Additionally, the biggest takeover of the domestic companies by international partners can be observed in 2007-2008 when the number of companies with predominating foreign capital share jumped from 19 to 32, respectively. Moreover, it is evident that the foreign investors were not discouraged to enter in this sector during the global financial crisis.

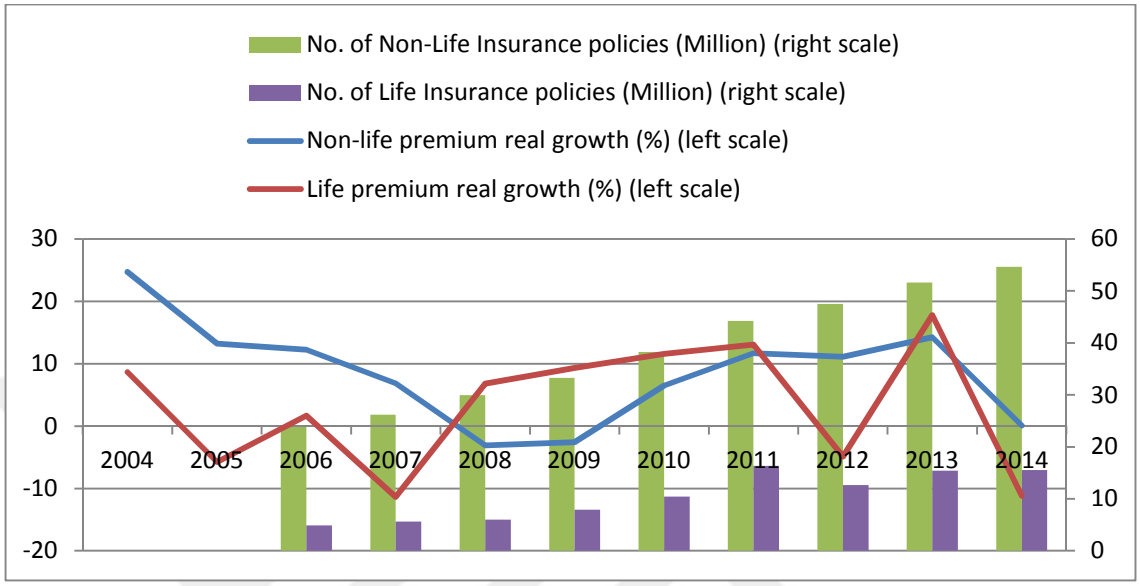
Figure 7: Structure of the Insurance and Pension Sector in Turkey



Source: Undersecretariat of Treasury

If we consider the premium production during the last decade, separately, for non-life and life insurance, the non-life insurance premiums experienced continuing positive growth, except during the crisis period, while the life insurance premiums recorded more frequent fluctuations. Concentrating on the life insurance branch, the negative real growth rates are mainly caused by the substitution effects with the private pension system. For instance, with the pension system taking into effect in 2003, individuals have mostly preferred to join private pension system, and in addition many insured individuals transferred their life insurance portfolio to pension system. Furthermore, the major reason for the decrease in life insurance premium production in 2007 was the privileged tax advantages granted to Private Pension System that contributed private pension schemes to supersede cumulative life insurance products. In 2012, several changes in the Turkish Commercial Code and tax laws reduced the attractiveness of the life insurance products and caused slight decrease in premium production for credit life insurances. Most recently in 2014, life insurance premium went down by -11.2% in real terms, primarily, due to decreased sales of state controlled insurance companies, while the companies with predominant foreign capital managed to increase their life insurance business.

Figure 8: Premium Growth Rates and Number of Insurance Policies Issued



Source: Undersecretariat of Treasury

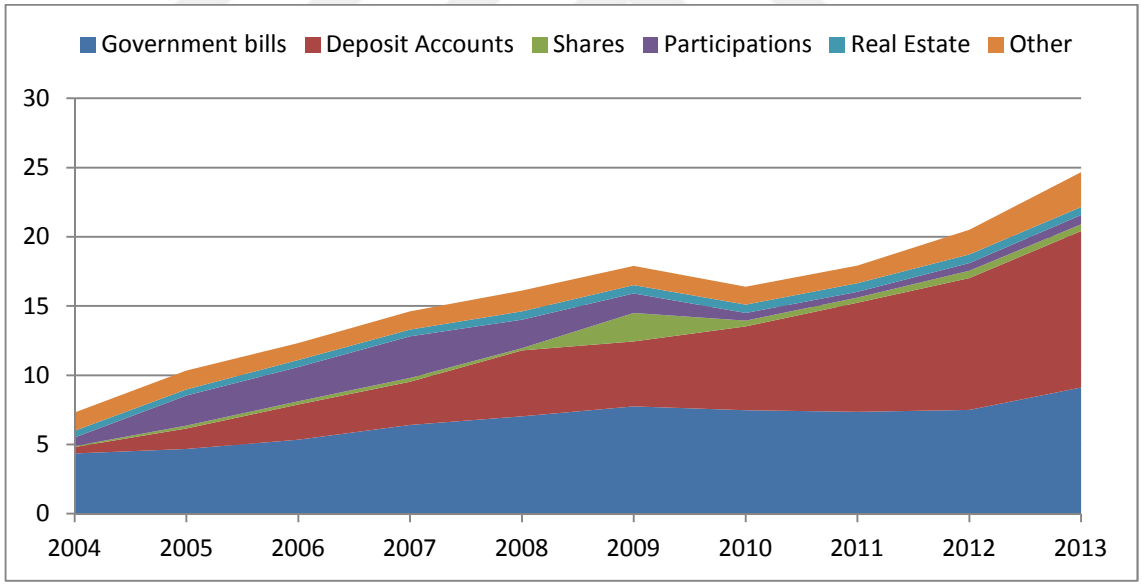
Regarding the non-life insurance branch, the negative growth tendencies are observed during 2008-2009 and sharp slowdown in premium production in 2014. In 2008, the decrease in the premiums is driven by the fall of the Accident branch's premiums due to price liberalization in the Compulsory Traffic Insurance.[16] In the following year, the negative shocks of the financial crisis have been transmitted to the insurance sector. In general, the crisis had impact on Marine cargo insurance because of the decrease in export and import which is a result of contraction in domestic and foreign demand. On the other hand, the decrease in commodity prices resulted in loss of premium. Additionally, the severe price competition in the Accident branch adversely affected the premium growth in the non-life business. However, when the number of policies sold is examined, an increase is observed despite the contracting economy. The real growth rate of the non-life insurance premiums of 0.1% in 2014 was result mainly due to the slowdown in the motor insurance classes (Motor Hull and MTPL) that generate about 41% of the total insurance market. This is largely attributable to the decreasing consumer lending activity in the banking sector. Additional restrictions on consumer lending and higher interest rates introduced in the beginning of 2014 hindered the motor

[16] Price liberalization has started in Compulsory Traffic Insurance on 1 July 2008. Insurance companies determine their tariffs freely every three months in line with the appropriate criteria.

insurance segment's dynamic, traditionally intimately related to car sales volume which plummeted significantly. Also, the elevated competition pressure in the MTPL line lowered the average premium resulting in negative impact on the profitability of insurers that sell this product.

Insurers and reinsurers as creators of funds for the economy have different impact on one economy depending on their investments' structure. More they channel their funds towards the private sector, the higher probability those funds to be productively used and consequently resulting in potential accelerated economic growth. Otherwise, if those funds mainly are channeled towards governmental consumption, the long-run effect of these investment activities on economic growth may disappear. The shallow capital market in Turkey restricts the investment activity of the insurance and reinsurance companies by offering only limited range of investment instruments.

Figure 9: Structure of the Insurers and Reinsurers' Investments (Millions TL)



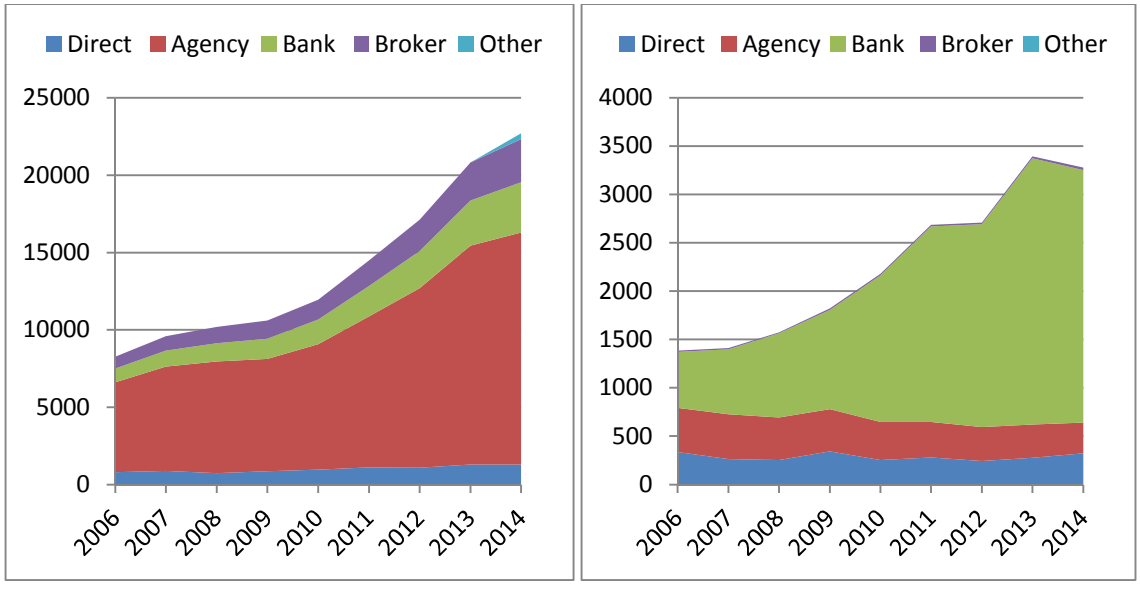
Source: Association of Insurance and Reinsurance Companies of Turkey

As their assets constantly grow, their investments follow the same tendency, except the small decrease in 2010. The structure of insurers and reinsurers' investments show that the market is predominated by non-life insurers that are risk aversive regarding their investment activity. Above 80% of their investments are directed to highly liquid and secure instruments such as deposit accounts and government bills. However, looking at figure 9, we see that deposit accounts, in 2013,

46% of total investments (the red area) predominate after the crisis period when the banking sector returned its confidence and stability, so the insurers and reinsurers as passive investors started to deposit their funds in the banks. Another important development in this context is the structure of the orange area in the figure 9 which, in the period 2011-2013, there is growing importance of the investments in private sector bonds.[17] In 2013, their share in total investments is 5.71% more than that of investments in shares, participations or real estate. This means that insurance and reinsurance companies try to make their investments' structure more heterogeneous as much as capital markets allow and properly implement asset-liability management principles in order to lower the risks they face with.

Lastly, we want to scrutinize the distribution channels' structure during the last decade. Insurers mainly sell their policies through their agents, through the intermediation provided by brokers or banks, and directly from their offices. However, if we observe life and non-life insurance business separately the structure appears to be different.

Figure 10: Distribution of Premium Volume in Non-Life Insurance Branch (Left) and Life Insurance Branch (Right) (Millions TL)



Source: Association of Insurance and Reinsurance Companies of Turkey

[17] During the period 2009-2013, y-o-y growth rate of the investment in private sector bonds was 127%.

Non-life insurers during the last 8 years were selling their policies largely through their agents. In 2014, they accumulated 66% of total premium through their agents. Probably this is expected if we take into account that motor insurance dominates the non-life insurance branch whereas the common practice is selling policies by agents. The bancassurance[18] is showing growing importance in the last three years, but still with insignificant share. Considering the distribution channels' structure in the life insurance branch, it is evident that life insurance products are being sold mostly through the banks. Their share in 2014 was 80% of the total life insurance premium. Probably, this upward trend of bancassurance in the life insurance sector is driven by the rapid increase in life insurance policies in connection to personal loans with the help of the enlarged volume of mortgage and consumer credits starting from 2008. Hence, Figure 10 indicates enhanced connection between the banking and insurance sector in Turkey, especially after the crisis period.

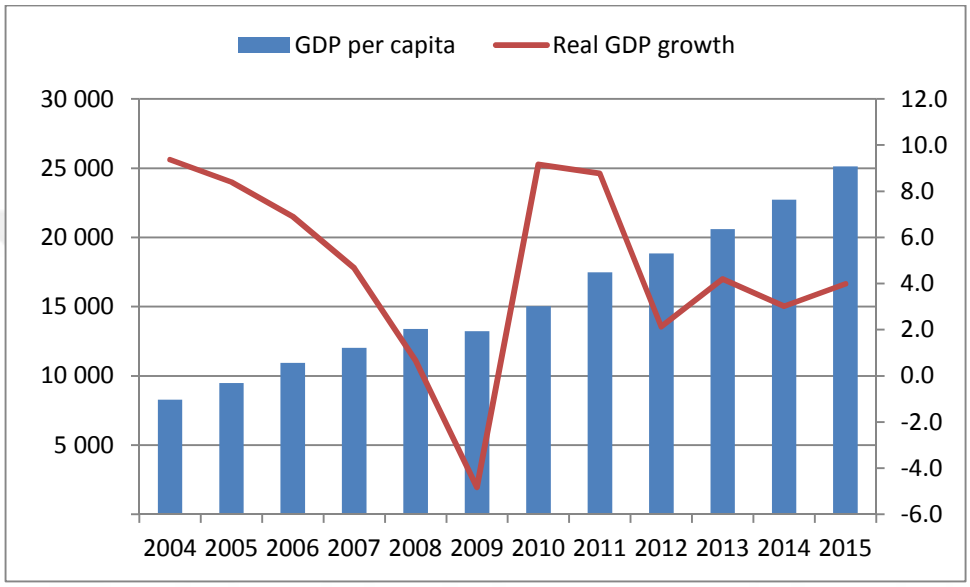
2.2.2. The Relationship between Insurance Sector Development and Economic Growth

Up to the financial crisis in 2008 Turkish economy showed strong growth rates, with its GDP growing year-over-year at 6.64% between 2004 and 2007. Sound macroeconomic policies such as cautious monetary policy, fiscal discipline and structural shifts in the banking contributed to such growth rates. All of that including augmented global liquidity stimulated large influx of foreign direct investments and portfolio flows. On the other hand, inflation rate was stabilized at lower level compared to the level before the 2001 crisis. This was result of the sound macroeconomic policies envisioned during that period. During the 2008 crisis sudden reversal in net capital flows occurred caused by huge capital outflows from the country, liquidity conditions tightened and bank lending declined. Additionally, external and domestic demand slump happened due to the loss of business and household confidence, external shocks, and uncertainties in the international environment, domestic consumption and investment dropped, and exports slumped. This resulted in negative growth rate of 4.8% in 2009.

[18] Bancassurance means selling insurance products through banks.

After the global financial crisis, the economy recovered quickly mostly due to tax inducements, private consumption revival led the whole economy's recovery. During the period 2012-2015 the y-o-y growth averaged 3.73% besides the political instability.

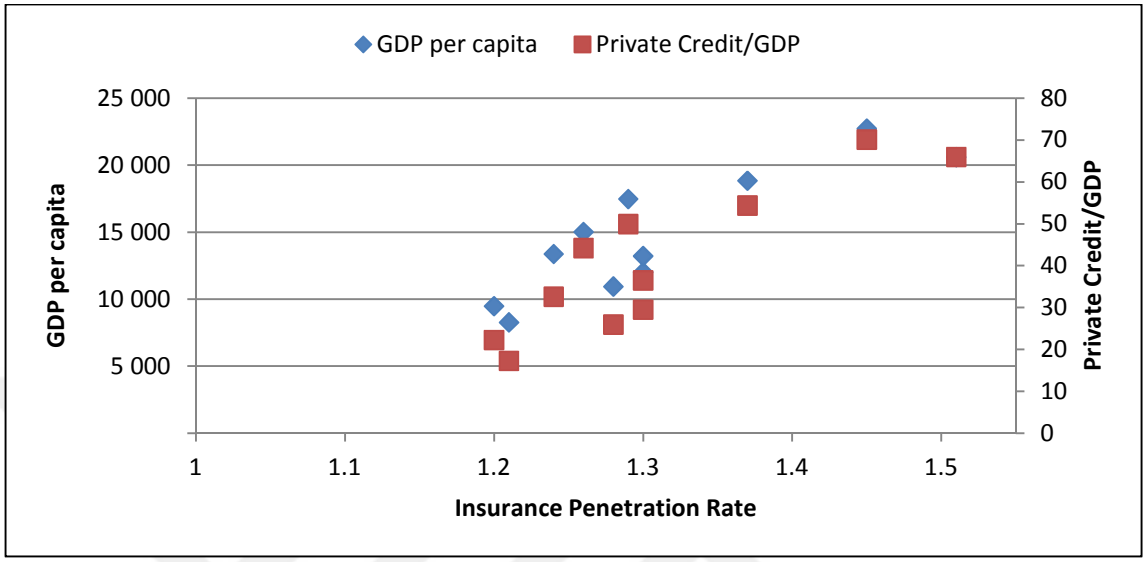
Figure 11: GDP per Capita and Real GDP Growth in Turkey



Source: Turkish Statistical Institute

The potential relationship between insurance sector development and economic development in Turkey can be shown through scatter diagram. Additionally, backed up by the theoretical background about economic growth-insurance-banking interrelations and by the insights given in the part two of this study, we plot GDP per capita, insurance penetration rate and the ratio of the private credit given by banks to GDP for the period 2004-2014. In the figure 12, the increasing tendency can be noted among all variables.

Figure 12: Indicators for Economic, Insurance and Banking Development (2004-2014)



Source: XPRIMM; Turkish Statistical Institute; World Bank

In Table 2, the correlation matrix can be observed. All three variables are highly correlated that might indicate potential causal relationship among all of them.

Table 2: Correlation Matrix

	Insurance Penetration	GDP per capita	Private Credit/GDP
Insurance Penetration	1		
GDP per capita	0.87	1	
Private Credit/GDP	0.89	0.99	1

As a conclusion, the analysis for Turkey implies that potential relationship between the insurance sector development and economic growth, as well as, between insurance sector development and banking sector development might exist, however the definite conclusion cannot be drawn. In the following part the existence of causal relationship between these variables is investigated by proper econometric analysis for the case of Turkey.

PART THREE

CAUSALITY RELATIONSHIP BETWEEN INSURANCE DEVELOPMENT AND ECONOMIC GROWTH

3.1. METHODOLOGY

An array of recent empirical work on insurance-growth nexus has focused on cross-country growth regressions based on endogenous growth models. However, such growth regressions have been subjected to a variety of criticisms from many authors. According to Doppelhofer et al. (2000), growth theories do not state explicitly what variables should be included in the "true" growth regression. Thus, the empirical economists conduct various exercises, trying to find what variables are potentially important determinants of growth. The potential explanation of this problem is the open-endedness of growth theories. Open-endedness implies that the validity of one theory of growth does not imply the falsity of another (Brock and Durlauf, 2001: 234). Durlauf and Quah (1999) question the aim that a researcher wants to achieve by adding a particular control variable, even when the variable is justified by a particular economic theory. For instance, the basic Solow-Swan model frequently was being extended with various controls including inequality, political regime, or trade openness. All of these are often highly correlated with one another, and are neither mutually exclusive nor prioritized as potential explanations of growth. Hence, arbitrarily choosing a possible control could undermine the statistical significance of whole regression.

Additionally, Brock and Durlauf (2001) add two more critics to the conventional growth analyses. First, vast of the empirical growth studies assume that parameters important for growth are identical across countries. They claim that this assumption is surely implausible. Second, they argue that the majority of empirical growth studies treat the various growth controls as exogenous variables and so rely on ordinary or heteroscedasticity-corrected least squares estimation. However, many of those controls used to explain growth patterns are as much result of socioeconomic decisions and interrelationships as growth itself is. Consequently, regressor endogeneity could be

resolved by employing instrumental variables. However, this practice could not adequately address this problem because of the failure to account properly for the open-endedness of growth theories.

Due to these weaknesses, examining the relationship between insurance development and economic growth by adopting endogenous growth model, especially for country-specific study, might be challenging. The dynamics of production structures and specific policies and institutions that comprise one economy are intrinsically tied to the economic development of every developing country (Ocampo, 2005:4). This requires extensive analyses of these issues in order growth regression to be appropriately performed. Alternatively, constructing a VAR model will enable testing for causality relations between insurance development and economic growth by considering the endogeneity of the variables. In the following section, this approach is explained with its positive and negative sides.

3.1.1. Testing for Unit Roots

Common practice in applied econometric researches is testing for the order of integration. To properly estimate an econometric model and avoid spurious regression problem, it is crucial to figure out whether data generating process of variables are stationary processes or not. Stationarity means that variance and covariance are finite and independent of time. Standard estimation is questionable when non-stationary series appear in the regression. Unit root tests help us to classify series as stationary and non-stationary. The classification of variables on stationary and non-stationary will help long-run and short-run effects in the model to be sorted out, and appropriate model to be developed according to which statistical inference will be meaningful (Sjö, 2008: 2).

Regarding the dominance of some unit root tests, there is no uniformly powerful test for unit root. Extensively utilized in the empirical studies, Dickey and Fuller (1979) and Phillips and Perron (1988) tests appear to be widely accepted as appropriate tests to clarify the order of integration of variables. Basically, if we consider a simple first order autoregressive process:

$$y_t = \rho y_{t-1} + x_t'\delta + \epsilon_t \quad (1)$$

where x_t are optional exogenous regressors which may comprise constant, or a constant and trend, ρ and δ are parameters to be estimated, and the ϵ_t is assumed to be white noise. If $|\rho| \geq 1$, y is a non-stationary series and the variance of y increases with time and approaches infinity. If $|\rho| < 1$, y is stationary series. Thus, the hypothesis of stationarity can be estimated by testing whether the absolute value of ρ is strictly less than one.

Dickey-Fuller (DF) test is the basic test regarding unit root tests. The standard DF test is carried out by estimating Equation (1) after subtracting y_{t-1} from both sides of the equation:

$$\Delta y_t = \pi y_{t-1} + x_t'\delta + \epsilon_t \quad (2)$$

where $\pi = \rho - 1$. In this model we know, under the null, that $\hat{\pi}$ is biased downwards and consequently, the significance of π is tested as a one-sided t-test. The problem is that the test statistics associated with $\hat{\pi}$ is non-standard. If y_t is a stationary variable $\hat{\pi}$ would asymptotically follow a normal distribution, and standard tests would be possible. It can be shown that if y_t is a random walk, that the distribution of $\hat{\pi}$ is skewed under the null (Sjö, 2008: 3). Earlier, Dickey and Fuller simulated critical values for various test and sample sizes, however, more recently, Mackinnon (1991, 1996) updated and expanded a much larger set of simulations comparing to those tabulated by Dickey and Fuller.

If the series is an AR(1) process then simple DF unit root test could be implemented. However, if the series is correlated at higher order lags, the assumption of white noise disturbances ϵ_t is violated. The Augmented Dickey-Fuller (ADF) test constructs a parametric correction for higher-order correlation by assuming that the y series follows an AR(p) process and adding p lagged difference terms of the dependent variable y to the right-hand side of the test regression:

$$\Delta y_t = \pi y_{t-1} + x_t'\delta + \beta_1 \Delta y_{t-1} + \beta_2 \Delta y_{t-2} + \cdots + \beta_p \Delta y_{t-p} + \upsilon_t \quad (3)$$

This augmented specification is then used to test $H_0: \pi = 0$ and $H_1: \pi < 0$. Here, the asymptotic distribution of the t-ratio for π is independent of the number of lagged first differences included in the ADF regression.

Sjö (2008) proposes recommendation how to resolve the problem whether to include exogenous variables in the regression or not. At the beginning, the model containing both a constant and a trend is estimated, due to the fact that this model is the least restricted. If a unit root is rejected here, due to a significant $\hat{\pi}$, no need to proceed with testing. If $\hat{\pi} = 0$ cannot be rejected, the efficiency of the model could be improved by excluding the time trend. Additionally, we need to specify the number of lagged difference terms to be added to the regression. For that reason, the Schwarz criterion (SC) was used to determine the lag length.

In addition, Phillips and Perron (1988) upgrade the procedure for testing the presence of a unit root in a general time series setting proposed by Phillips (1987), by including a drift and a drift and a linear trend in the specification. In general this non-parametric approach allows for a wide range of time series models in which there is a unit root (Kugler and Ofoghi, 2005: 11). This model has significant improvement when there are moving average components in the time series. The Phillips-Perron method estimates the non-augmented DF test equation, and modifies the t-ratio of the π coefficient so that serial correlation does not affect the asymptotic distribution of the test statistic. By using this method, they allowed for some heterogeneity and serial correlation in errors. However, this test experiences considerable size distortions for models with moving average errors and negative serial correlation.

As in the case of ADF test, first we test by including constant and trend and if we cannot reject the null, then we try to improve the efficiency in the model by estimating without time trend. Moreover, in implementing Phillips-Perron test, we utilize Newey and West (1994) non-parametric method for automatically computing a bandwidth or a lag length parameter.

3.1.2. Specification of VAR

The vector autoregressive model (VAR) is frequently utilized in investigating the dynamic relationships among stationary variables. The VAR approach helps researchers to avoid the structural modeling of some regressions and to take account of endogeneity by regressing every endogenous variable on the lagged values of all of the endogenous variables in the system. Similarly, as in previous studies (Ward and Zurbruegg, 2000, Adams et al., 2009) we construct a reduced form vector autoregressive model (VAR) to test for granger causality in a bi-variate system, defined by:

$$y_{1t} = A(L)y_{1t} + B(L)y_{2t} + G_1 x_t + \epsilon_{y_1,t} \quad (4)$$

$$y_{2t} = C(L)y_{1t} + D(L)y_{2t} + G_2 x_t + \epsilon_{y_2,t} \quad (5)$$

where A(L), B(L), C(L), and D(L) are all lag polynomials with roots outside the unit circle and x is a set of exogenous variables to the system. The regression error terms, $\epsilon_{y_1,t}$ and $\epsilon_{y_2,t}$, are assumed to be mutually independent and individual processes. The Granger causality test between the variables involves a joint F- or χ^2- test to examine whether a variable, say y_{2t} can predict future values of y_{1t}. The null hypothesis is that of no linear causality, implying in Equation (4) that the coefficients of B(L) are not jointly significant different from zero. In the same way, in the case of testing whether y_{1t} causes y_{2t}, the test will be conducted on the coefficients contained in the C(L) to see whether they are jointly significant different from zero. If both B(L) and C(L) joint tests for significance show they are different from zero, the series are bi-directionally related.

If the time series are stationary, then such a constructed VAR model in levels can be used to test for Granger causality between the variables. However, if the time series are not stationary, namely they are so called integrated of order d or I(d), then the VAR framework needs to be modified to allow consistent estimation of the relationships among the series. According to Engle and Granger (1987) even if the series are non-stationary their linear combination is possible to be stationary. For such time series is said to be co-integrated. In such case, Vector Error Correction method (VECM) which is defined as a special case of the VAR for variables that are co-

integrated enables short- and long-term relationships between the time series to be investigated. The VECM comprises co-integration equation that restricts the long-term behavior of the endogenous variables to converge to their co-integrating relationship while allowing for short-term adjustment dynamics. Therefore, the co-integration equation will be non-zero and each variable adjusts to partially restore the equilibrium relation.

Considering the necessity for co-integration pretesting[19] in order modeling data to be properly performed, at least two problems may arise due to our small sample size. First, too small sample size might be difficult to satisfy the asymptotic characteristics that the co-integration tests rely on, and second, according to Clarke and Mirza (2006), the non-causal null hypothesis could be over-rejected if pretesting for co-integration is executed. Additionally, the co-integration is a long-term phenomenon that, if examined with such limited sample, it may result in wrong inferences. Thus, we are dropping out the possibility of testing for co-integration and implementing the VECM in case of non-stationary time series.

Furthermore, differencing the series d times until they become stationary and implementing the previously built VAR on those series offers additional option in dealing with non-stationary data. However, by doing this, possible long-run connection between the variables might be missed. In addition, Sims et al. (1990) argue that it is needless to transform the models to stationary form by differencing them. Given the weaknesses of differencing data, Toda and Yamamoto (1995) recommend a VAR model in levels for testing for Granger causality, by modifying the model selection procedure whereas the test-statistics will behave as in the stationary case. They recommend first choosing the lag-length using some information criterion, and then add the maximal possible order of integration, d_{max}, to this lag length. After that Wald test is conducted where a restriction is imposed on the first $laglength - d_{max}$ lags. Also, Clarke and Mirza (2006) concluded that Toda and Yamamoto's method appears to be superior and shows consistent performance over the wide range of investigated data generating processes. Consequently, we choose to implement Toda and Yamamoto's (T-Y) approach for testing the Granger causality between the variables.

[19] There are various co-integration tests available. Recently, extensively implemented by many researchers are: Johansen (1991, 1995) trace test and Pesaran and Shin (1999) bounds test.

Since the model is set up, choosing the lag selection method is the last phase before proceeding with the testing procedure. Clarke and Mirza (2006) advise applying two lag selection methods: Schwartz and Akaike criterion. They propose researchers to select the causality results that arise from a criterion that tends to overestimate the lag length when there is a conflict with the Schwarz criterion outcome. However, Schwarz criterion appears to be superior considering the better control of Type I error and higher empirical power in the case when both criteria propose same lag order. Thus, we follow this recommendation in our examination. After selecting the optimal lag length, a multivariate Lagrange multiplier (LM) test is applied to check for autocorrelation in the residual series.

3.2. DATA

The data span of this study covers the period 1998-2015 for two reasons: (1) regarding the economic development proxy, according to the new calculation principle implemented in 2007, the Turkish Statistical Institute re-calculated new time series of GDP starting from 1998 in which GDP figures do not comprise the same variables of the old series; (2) regarding the insurance development proxies, an important change was introduced in Turkey, namely, insurance companies were required to separate their life and non-life insurance activities starting from January 1, 1998 (The World Bank, 2003: 104). Consequently, there are only 18 observations and this might make the results questionable due to small sample bias that may arise. However, according to Ward and Zurbruegg (2000) the focus should be on the length of estimation period, rather than on the frequency of observations for examining co-integrative and causality relationships between the variables. Table 3 presents the descriptive statistics for all the variables used in the regressions.

Table 3: Descriptive Statistics

Variable	Mean	Median	Maximum	Minimum	Std. Dev.	Obs.
Real GDP per capita	1350	1371	1689	1048	213.2	18
Real GCF per capita	267.8	266.6	370.6	160.5	60.69	17
NLIP	1.043	1.080	1.396	0.661	0.197	18
LIP	0.190	0.192	0.227	0.134	0.022	18
NLID	14.08	14.97	21.72	7.559	4.473	17
LID	2.557	2.572	3.540	1.536	0.518	17
INV	1.426	1.408	1.880	0.803	0.268	16
BCREDIT	32.04	25.94	70.13	14.52	18.55	17
BASSETS	71.56	65.66	108.3	49.98	19.69	17

Following the previous studies, two variables are taken as a proxy for economic development: firstly, real GDP per capita (at constant 1998 prices) in domestic currency, as a standard measure for economic development and, secondly, gross capital formation (GCF) per capita in domestic currency at current prices as a measure of capital stock series.[20] The latter one was deflated by using implicit GDP deflator. The data of real GDP per capita was collected from the Turkish Statistical Institute, and the data of GCF and implicit GDP deflator was taken from World Bank data base. The GCF per capita variable is used to test the capital accumulation function of insurance.

Considering the insurance development proxies, annual insurance premium is taken on disaggregated basis (life and non-life) in order insurance penetration indicator to be calculated. Life and non-life products usually differ in terms of their duration. In general, life insurers provide longer-term products with savings elements, however, non-life insurers offer shorter-term indemnification products. Life (LIP) and non-life insurance penetration (NLIP) is calculated by taking gross written premiums (at current prices) from Insurance Association of Turkey, deflating them by using implicit GDP

[20] Also see, King and Levine (1993), Webb et al. (2002); Ćurak et al. (2009)

deflator, and dividing them by real GDP figures taken from Turkish Statistical Institute. Moreover, two additional variables are included as a measure of insurance development: non-life (NLID) and life insurance density (LID). The insurance density is calculated by dividing the real gross written premiums by population. Similarly, the data of population is collected from World Bank data base. Finally, wanting to examine the investment channel of the insurance companies, we include the ratio of real total investments[21] of insurance companies to GDP[22] (INV) as a final indicator for insurance development.

To take into account the interrelations between insurance and banking development, proxies for banking development are included. The Turkish financial sector is predominated by the banking sector, thus extending the study by these variables and observing the results may offer interesting insights regarding the insurance-growth and insurance-banking causality. Following the studies of King and Levine (1993), Levine et al. (2000), Webb et al. (2002), Beck and Levine (2004), ratio of credit to private sector by deposit money banks to GDP (BCRED) was taken as a proxy for banking development. The data of this indicator was collected from World Bank data base. Additionally, the importance of banking in one economy could be measured by the ratio of total assets of deposit money banks to GDP (BASSET). Thus, this variable is also included after transforming it in real values. The figures of this indicator were collected from The Banks Association of Turkey. However, regarding the GCF per capita and banking proxies, there is no available data for the year 2015, accordingly, the VAR models that comprise these variables, include 17 observations.

3.3. EMPIRICAL RESULTS

As mentioned in the previous sections, preliminarily, two basic unit root tests are used to test whether the variables have unit root: Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests. Mainly, we observe that most of the variables, after we difference them, become stationary that implies they are integrated of order one I(1).

[21] Total investments were not available on disaggregated basis for non-life and life insurance companies, so this indicator comprises total investments of all (non-life and life insurers and reinsurance companies). This includes: Investments in securities, real estate, deposit accounts, participations and loans.
[22] Available data for this indicator until December 2013

Following the Sjö (2008) decision rule, after selecting the least restricted model with intercept and trend for the variables GCFPC and NLID, we reject the null at 10% significance level and these series appear to be stationary. However, since the critical variables might be less valid for samples that contain fewer than 20 observations, we take into consideration the results at 5% and 1% significance level. Accordingly, we assume that the variable LIP is stationary at levels (integrated of order zero I(0)), and all other variables are stationary after differencing them, meaning that they are integrated of order one I(1). It is worth spotting the case of BCRED variable where in three out of four models, we failed to reject that the series are stationary after the first difference. Phillips-Perron non-parametric test seems to be inferior due to the serious size distortions in finite samples when the time series has a predominance of negative autocorrelation in first difference. After checking the autocorrelation structure which was predominated by negative coefficients, we suspect in the validity of the result and assume that BCRED is I(2) process.

Table 4: Unit Root Tests Results

	Levels				1st difference			
	ADF		PP		ADF		PP	
	Intercept and trend	Intercept	Intercept and trend	Intercept	Intercept and trend	Intercept	Intercept and trend	Intercept
GDPPC	-2.6064	0.1184	-2.9380	0.1184	-3.8933**	-4.0603***	-3.9793**	-4.4748***
GCFPC	-3.5310*	-1.6332	-4.6104**	-1.6332	-4.9021***	-5.1119***	-9.4260***	-9.7738***
NLIP	-2.7820	-0.8944	-2.8285	-0.8832	-3.9371**	-4.1857***	-3.9679**	-4.2430***
LIP	-3.0084	-3.3895**	-3.0055	-3.3591**	-3.8516**	-3.9899***	-3.8516**	-4.0264***
NLID	-3.5685*	-0.0816	-2.0081	-0.0816	-2.9758	-3.0950**	-2.9780	-3.1026**
LID	-2.8236	-1.9016	-2.8176	-1.9016	-4.3364**	-4.4861***	-4.3364**	-4.4861***
INV	-2.3651	-2.7764*	-2.4007	-2.7593*	-4.3968**	-4.7007***	-4.3637**	-4.7007***
Bcred	-0.9503	3.3506	-1.1584	3.4671	-3.5569*	-2.1728	-5.7271***	-2.0975
Basset	-1.2222	0.0101	-1.1642	-0.0352	-5.2318***	-4.2779***	-5.1761***	-4.2128***

***, **, * denote rejection of the null at the 1, 5, 10 percent level (MacKinnon (1996) one sided p-values)

In the following table, we summarize the decisions that we have made regarding the order of integration of the variables that is precondition for well specified VAR using the T-Y approach.

Table 5: Order of Integration

Variable	GDPPC	GCFPC	NLIP	LIP	NLID	LID	INV	BCRED	BASSET
I(d)	I(1)	I(1)	I(1)	I(0)	I(1)	I(1)	I(1)	I(2)	I(1)

Since the order of integration of the variables is defined, the maximum possible order of integration in each regression could be set as well. In general, in the regressions that comprise GDPPC, GCFPC or BASSET, the maximum possible order of integration is set to be I(1), and in the regressions that include BCRED, the maximum possible order of integration is I(2).

3.3.1. Non-Life Insurance Development and Economic Growth

In this part of the study, the granger causality between non-life insurance and economic development is examined by running various regressions that combine proxies of economic development (GDPPC and GCFPC) and the proxies of non-life insurance development (NLIP and NLID). The maximal order of integration of these variables is I(1), so when we run a regression, we add one more lag of each variable that is included in that VAR model. However, the significance of the coefficients is tested by implementing Wald test on those primarily included lags, not additionally added ones.

For choosing the optimal lag-length we use Akaike (AIC) and Schwarz (SC) criterion and both of them suggest using VAR(1) for all regressions.[23] However, Toda and Yamamoto (1995) advise that the order of integration of the process does not exceed the true lag-length of the model. Additionally, some econometricians warn that the model is too restricted if the maximal order of integration equals the true lag-length of the VAR model. Consequently, we decide to run VAR(1) and VAR(2), after checking

[23] Since we use annual data, we choose two lags as a maximum lag-length

the autocorrelation problem. The LM autocorrelation test shows that all regressions are free of serial correlation meaning we cannot reject the null[24] for all VAR models.

Table 6: Granger Causality Test Results between the Variables of Non-Life Insurance Development and Economic Growth

VAR(L)	Causality	χ^2	Autocorrelation (p-value)	AIC	SC
VAR(1)	NLIP→GDPPC	0.444	(1) 0.9634	**7.875**	**8.164**
	GDPPC→NLIP	2.572			
VAR(2)	NLIP→GDPPC	2.640	(1) 0.5789 (2) 0.6199	8.328	8.811
	GDPPC→NLIP	2.121			
VAR(1)	NLIP→GCFPC	2.215	(1) 0.8943	**7.606**	**7.889**
	GCFPC→NLIP	1.425			
VAR(2)	NLIP→GCFPC	9.910***	(1) 0.1926 (2) 0.9231	7.940	8.412
	GCFPC→NLIP	0.267			
VAR(1)	NLID→GDPPC	0.275	(1) 0.9382	**13.470**	**13.754**
	GDPPC→NLID	0.776			
VAR(2)	NLID→GDPPC	2.479	(1) 0.2263 (2) 0.8002	13.824	14.296
	GDPPC→NLID	0.613			
VAR(1)	NLID→GCFPC	3.638*	(1) 0.8550	**13.359**	**13.642**
	GCFPC→NLID	0.172			
VAR(2)	NLID→GCFPC	9.137**	(1) 0.1076 (2) 0.9895	13.704	14.176
	GCFPC→NLID	1.913			

***, **, * denote rejection of the null at the 1, 5, 10 percent level (Wald Test)
Intercept is included in all of the regressions

From table 6, it is obvious that the null hypothesis of no Granger causality between the non-life insurance variables (NLIP and NLID) and real GDP per capita cannot be rejected, implying that non-life insurance development does not drive economic growth. Concentrating only on the case of Turkey, this result is similar to the findings of Sarioğlu and Taşpunar (2011), but contradictory to the results of Yıldırım (2015) who found that GDP growth Granger causes non-life insurance premiums growth. However, observing the other cases in which GCFPC appears as a growth variable, we support the hypothesis that non-life insurance development induces increased capital accumulation. Namely, NLIP and NLID, uni-directionally, Granger cause GCFPC at the 1% and 5% confidence level, respectively. Similarly, Petrova (2014) states that non-life insurance development causes economic development, and

[24] The null hypothesis is that all autocorrelations and cross autocorrelations of order lag or less are zero.

this type of insurance plays greater role, especially, in developing countries. The results lure us to conclude that the growing importance of non-life insurance sector in the Turkish economy induces some capital creation, however that does not translate in higher GDP per capita, probably, because of short-term nature of the channeled funds or, because of the underdeveloped financial system which does not provide proper instruments so accumulated funds to be productively invested, yet.

3.3.2. Life Insurance Development and Economic Growth

Utilizing the same procedure, we investigate the causality relationship between life insurance development and economic growth. Here, both of the life insurance variables, LIP and LID, individually, uni-directionally Granger cause real GDP per capita, at 5% and 10% confidence level, respectively. Moreover, LID movements fuel GCFPC changes, and that suggests that life insurance development drives increasing capital accumulation. The results supported previous studies of Webb et al. (2002); Kugler and Ofoghi (2005); Arena (2008); Ćurak et al. (2009); Han et al. (2010); Chen et al. (2012); Oke (2012); Chau et al. (2013) that life insurance development has positive and long-term impact on economic growth. The possible explanation for such result can be given if we consider the structure of the economy and source of growth. As Li et al. (2007) claim that developed countries highly relied on services industry and more toward knowledge base economy, while developing countries' economic growth depended on capital formation, and manufacturing based economic structure. Rodrik (2012) warns that the Turkish economic-development model which is based on foreign savings and large current-account deficits can create respectable growth, but such economy seems to be fragile and proposes the growth to be financed domestically by increasing the domestic savings that, currently, are still relatively low. Perhaps, life insurance companies, as engines that mobilize domestic savings, help in the transformation process of the growth model to more domestically financed one, and in the same time, supporting increased capital creation.

Table 7: Granger Causality Test Results between the Variables of Life Insurance Development and Economic Growth

VAR(L)	Causality	χ^2	Autocorrelation (p-value)	AIC	SC
VAR(1)	LIP→GDPPC	1.156	(1) 0.6519	**5.802**	**6.092**
	GDPPC→LIP	1.148			
VAR(2)	LIP→GDPPC	6.727**	(1) 0.6741 (2) 0.4665	6.053	6.536
	GDPPC→LIP	2.484			
VAR(1)	LIP→GCFPC	0.036	(1) 0.7486	**5.683**	**5.967**
	GCFPC→LIP	1.309			
VAR(2)	LIP→GCFPC	2.843	(1) 0.9701 (2) 0.2983	6.019	6.491
	GCFPC→LIP	0.943			
VAR(1)	LID→GDPPC	0.955	(1) 0.6531	**11.287**	**11.570**
	GDPPC→LID	0.608			
VAR(2)	LID→GDPPC	5.333*	(1) 0.7074 (2) 0.3711	11.582	12.054
	GDPPC→LID	2.100			
VAR(1)	LID→GCFPC	0.131	(1) 0.6724	**10.962**	**11.245**
	GCFPC→LID	1.058			
VAR(2)	LID→GCFPC	5.332*	(1) 0.9033 (2) 0.3001	11.231	11.703
	GCFPC→LID	1.022			

***, **, * denote rejection of the null at the 1, 5, 10 percent level (Wald Test)
Intercept is included in all of the regressions

Although, these findings seem weak because they are obtained from different VAR models, rather than from those suggested by AIC and SC, extending the VAR model to two lags does not affect the condition that it is well-specified and does give additional insight of the longer-term interrelationships between these variables. In fact, the evidence of some kind of Granger causality may presume that those variables are co-integrated.

3.3.3. Investments of the Insurance Sector and Economic Growth

The examination of lead-lag relation between the investments of insurance and reinsurance companies and economic development is included in the third part of our analyses. In general, the structure of the liabilities of non-life and that of life insurance companies differ in terms of whether the long or short term liabilities prevail in their balance sheets. In the case of non-life insurance companies, their liabilities are predominated by short-term liabilities, due to the nature of their products, and by implementing the assets-liability management principles, it is preferable for them to invest in short-term assets in order to lower the risk that may arise from maturity mismatch. On contrary, life insurance companies' liabilities are mainly long-term. That enables the life insurers to channel the funds to longer-term investments. It is evident that the difference between non-life insurers' and life insurers' investments is crucial in observing the effects that they may have on economic development. However, such disaggregated data was not available for Turkey. So, we need to work with the available data on aggregated basis (for non-life and life insurance companies together) in order to find some pattern of causality between these variables.

Table 8: Granger Causality Test Results between the Investments of Insurance and Reinsurance Companies and Economic Growth

VAR(L)	Causality	χ^2	Autocorrelation (p-value)	AIC	SC
VAR(1)	INV→GDPPC	0.543	(1) 0.4717	**10.279**	**10.553**
	GDPPC→INV	2.644			
VAR(2)	INV→GDPPC	2.207	(1) 0.3192 (2) 0.7703	10.524	10.980
	GDPPC→INV	6.721**			
VAR(1)	INV→GCFPC	0.924	(1) 0.7446	**9.534**	**9.808**
	GCFPC→INV	3.537*			
VAR(2)	INV→GCFPC	1.156	(1) 0.7220 (2) 0.6763	9.986	10.442
	GCFPC→INV	6.898**			

***, **, * denote rejection of the null at the 1, 5, 10 percent level (Wald Test)
Intercept is included in all of the regressions

Here, the VAR models include the following combinations of the variables, assuming that all are I(1) process: GDPPC and INV, or GCFPC and INV. Due to the reason mentioned earlier, repeatedly, we run VAR(1) and VAR(2), besides the fact that

AIC and SC suggest using VAR(1). All of the regressions are well specified and free of autocorrelation. The results from the Table 8 illustrate that there is a strong one directional Granger causality between the economic development and investments of the insurance and reinsurance companies, running from economic improvement towards amplified investment activity of the insurance sector's participants. Namely, GDPPC drives INV at the 5% confidence level in VAR(2), and GCFPC causes INV at the 10% and 5% confidence level, including one and two lags, respectively. Only two studies included proxies for investment activity of the insurance companies (Njegomir and Stojić, 2010[25]; Sarioğlu and Taşpunar, 2011),[26] and both of them found that investments of insurance companies positively affect economic growth. Inferring from the obtained results, most likely much stable and faster growing economy furnish insurers and reinsurer with confidence to increase their investment activity. Along with that, since the greatest fraction of these investments belongs to non-life insurers this result confirms the long-run relationship between the non-life insurance development and economic development.

3.3.4. Insurance-Banking Causality

Regarding the insurance-banking interrelationships, authors generally investigate conjoint effect that insurance and banking development may have on economic growth, by including interaction term in their models[27] assuming that complementarities might exist. Other researchers examine this relationship by regressing an insurance variable on various variables including proxy of banking development. For instance, Beck and Webb (2003) confirmed the importance of banking sector development in predicting life insurance consumption. They suggest that well-functioning banks may increase the confidence consumers have in the financial system and increase the efficiency of financial transactions. On the other side, banks, for example, may more readily offer credit when insurance is present. Therefore,

[25] Njegomir and Stojić (2010) used technical reserves of life and non-life insurers as a measure for insurance sector investments

[26] Sarioğlu and Taşpunar (2011) test the causality between insurers' investments and economic growth by including the ratio of financial assets of insurers to GDP

[27] For example, see Webb et al. (2002); Arena (2008)

causality may move in both directions. Only few studies investigate this relationship by employing Granger causality testing[28] and results, mainly, vary according to the examined period.

Since two variables for banking development and five variables for insurance development are selected in this study, all of them are combined by using the previously developed bi-variate VAR model. Differently from previous regressions, BCRED is I(2) process, so, according to T-Y approach, the VAR models that contain this variable should include at least two lags for each variable. Accordingly, those VAR models comprise two lags of each variable regardless of AIC and SC suggestion.

Table 9: Granger Causality Test Results between Insurance Variables and BCRED

VAR(L)	Causality	χ^2	Autocorrelation (p-value)	AIC	SC
VAR(2)	NLIP→BCRED	1.524	(1) 0.5812 (2) 0.5476	2.104	2.576
	BCRED→NLIP	2.254			
VAR(2)	NLID→BCRED	0.622	(1) 0.4084 (2) 0.6454	7.803	8.275
	BCRED→NLID	0.959			
VAR(2)	LIP→BCRED	2.451	(1) 0.3046 (2) 0.5956	**-0.168**	0.303
	BCRED→LIP	3.841			
VAR(2)	LID→BCRED	3.479	(1) 0.6839 (2) 0.7236	4.834	5.306
	BCRED→LID	0.797			
VAR(2)	INV→BCRED	8.580**	(1) 0.4586 (2) 0.3758	4.197	4.654
	BCRED→INV	3.446			

***, **, * denote rejection of the null at the 1, 5, 10 percent level (Wald Test)
Intercept is included in all of the regressions

Table 9 shows the results of the causality relationship between credit given to the private sector by banks and insurance development variables. Only one VAR model is specified according to the AIC. During this period, the lead-lag relationship between non-life insurance and banking, and life insurance and banking cannot be found, which is similar to the outcome of Sarioğlu and Taşpunar's (2011) study. The variable INV is the only one that shows significance at 5% confidence level. Thus, the total investments of insurance and reinsurance companies affect the banks' private credit production. This result may not seem surprising due to the fact that large portion of those investments are in deposit accounts in the banks. Consequently, we can conclude that

[28] Adams et al. (2005); Sarioğlu and Taşpunar (2011)

insurers and reinsurers support the banks' lending capacity by channeling their funds in deposit accounts.

In the second part of this analysis, BASSET is taken as a proxy of banking development. Here, the procedure is the same as in the previous cases where GDPPC and GCFPC were combined with insurance development variables. We found weak evidence that life insurance development helps in predicting banking development. Namely, LIP Granger causes BASSET at 10% confidence level. The possible explanation for such result might be increasing development of bancassurance. In fact, banks appear as the most frequently used distribution channel for life insurance policies in Turkey. Selling life insurance through their branches expands the customer base of the banks and enforces assets size expansion.

Table 10: Granger Causality Test Results between Insurance Variables and BASSET

VAR(L)	Causality	χ^2	Autocorrelation (p-value)	AIC	SC
VAR(1)	NLIP→BASSET	1.752	(1) 0.9164	**3.883**	**4.166**
	BASSET→NLIP	0.077			
VAR(2)	NLIP→BASSET	3.799	(1) 0.6139 (2) 0.6397	4.393	4.865
	BASSET→NLIP	3.124			
VAR(1)	NLID→BASSET	0.271	(1) 0.9170	**9.740**	**10.023**
	BASSET→NLID	0.005			
VAR(2)	NLID→BASSET	4.148	(1) 0.3731 (2) 0.9246	10.148	10.620
	BASSET→NLID	2.645			
VAR(1)	LIP→BASSET	3.503*	(1) 0.4032	**1.964**	**2.247**
	BASSET→LIP	1.681			
VAR(2)	LIP→BASSET	2.474	(1) 0.8722 (2) 0.7958	1.991	2.463
	BASSET→LIP	1.954			
VAR(1)	LID→BASSET	0.091	(1) 0.6452	**7.339**	**7.623**
	BASSET→LID	0.053			
VAR(2)	LID→BASSET	0.051	(1) 0.9333 (2) 0.9136	7.581	8.053
	BASSET→LID	1.216			
VAR(1)	INV→BASSET	1.145	(1) 0.6336	**5.924**	**6.198**
	BASSET→INV	0.010			
VAR(2)	INV→BASSET	0.749	(1) 0.9774 (2) 0.3599	6.152	6.609
	BASSET→INV	0.643			

***, **, * denote rejection of the null at the 1, 5, 10 percent level (Wald Test)
Intercept is included in all of the regressions

CONCLUSION

The study examines empirically the relation between insurance and economic growth, and additionally between insurance and banking in Turkey using a time-series data set for the period 1998-2015. According to the theoretical background, insurance sector could promote economic growth through the following main channels: 1) through promoting financial stability as a stabilizer of the financial situation of individuals, families and businesses, and as a key contributor in creating much sound financial system; 2) through well-organized cooperation between the state and private insurance sector to support in cutting the costs of the state social security programs and enabling the private insurance sector to accept risks that previously were considered as uninsurable due to lack of capacity; 3) through facilitating trade and commerce by providing different kinds of insurance products that enable risk aversive individuals and entrepreneurs to undertake higher risk, higher return activities, promoting higher productivity and growth; 4) through mobilizing savings and channeling them in productive uses; 5) through efficient risk management by providing appropriate risk management skills and information and pooling the risks to limit the severity of financial losses; 6) through incentivizing loss mitigation measures; 7) through fostering more efficient capital allocation and creating liquidity.

Since setting up an econometric growth model to test for the relationship between insurance sector development and economic growth seems to be challenging, especially for country-specific study, we utilized alternative econometric way to test this relation by constructing reduced form vector autoregressive model (VAR) to test for granger causality in a bi-variate system. Five measures for insurance sector development (non-life insurance penetration, life insurance penetration, non-life insurance density, life insurance density and the ratio of investments of insurers and reinsurers to GDP), two for economic development (real GDP per capita and real gross capital formation per capita) and two for banking development (ratio of credit to private sector by deposit money banks to GDP and ratio of total assets of deposit money banks to GDP) are included in our regressions. Annual data is collected for the period 1998-2015. The abovementioned model is modified according to the suggestions of Toda and Yamamoto (1995).

The paper finds that both non-life and life insurance sector stimulate capital accumulation, although only the latter one appears as a prerequisite for stimulating economic growth. These findings are strongly consistent with the theory that suggests that the function of collecting and accumulating contractual savings is the main function of insurance (especially for life insurance), which positions insurers in their role as institutional investors, in which they have the function of allocation capital efficiently in the economy. The direction of causality changes if we take the investments of insurers and reinsurers on aggregated basis. Namely, economic growth and growing capital creation induce increasing investment activity of insurers and reinsurers. All of this presumes long-run relationship between economic development and insurance sector development. Data limitations restricted us regarding testing for joint significance of banking and insurance in stimulating economic growth, however we checked for the causality relation between banking and insurance during the observed period and found that life insurance development and augmented investment activity drive banking development. These conclusions, however, must be qualified. While we exhibit results suggesting that insurance development spur economic and banking development, the fact that the results are not fully consistent across all specifications may lead some to conclude that overall insurance development matters for growth but it is difficult to identify the specific components of the sector most closely associated with economic growth.

As we analyzed in the theoretical part and according to the previous studies, our empirical work confirms the positive association of insurance development and economic growth. Although we did not face any significant limitations, data unavailability and changes in the calculation of some variables restricted us to the period 1998-2015 that resulted in small sample analysis and too aggregated variables. Consequently, we could not test the joint importance of banking and insurance in supporting economic development.

In the end, we accentuate that this causality relationship is not static and the direction of causality changes depending on the period of investigation. There is enough theoretical and empirical evidence that both can cause each other. However, in order insurance development to spur economic prosperity, first, some pre-conditions are needed such as developed financial system, increased education and awareness, better living standards and others. This may presume that during that period when

these pre-conditions are developing causality may move from economic growth towards insurance development. This type of reasoning could be subject of some future research in which longer time series data could be analyzed during different historical periods. Additionally, in the second part of this study we have seen that special lines of insurance business respond in a different way to the change in the regulatory framework or economic conditions in general. This opens the horizon for future investigation even on more disaggregated basis.

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