Insurance Sector Development and Economic Growth

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In this paper we empirically examine relationship between insurance sector development and economic growth in 10 transition asian Union member countries, in the period from 1998 to 2013. We apply fixed-effects panel model and control for other relevant determinants of economic growth and endogeneity. According to our findings, insurance sector development positively and significantly affects economic growth. The resultsare confirmed in terms of both life and non-life insurance, as we ll as, total insurance.

Keywords: Insurance, Economic growth, Endogenous growth theory, Panel analysis JEL Classification Codes: C23, E44, G22, O11, O16

1. Introduction

According to the finance-growth nexus theory financial development promotes economic growth through channels of marginal productivity of capital, efficiency of channeling saving to investment, saving rate and technological innovation (Levine, 1997). Affecting economic growth through the channels is realized by functions of financial intermediaries. The functions include the provision of means for clearing and settling payments to facilitate the exchange of goods, services and assets, the provision of a mechanism for pooling resources and the subdivision of shares in various enterprises, resource allocation, risk management, price information to help coordinate decentralized decision-making in various sectors of the economy, and the means to deal with the incentive problems created when one party of a financial transaction has the information that the other party does not, or when one party acts as an agent of the other (Merton and Bodie, 1995). A numerous empirical studies confirm International Research Journal of Finance and Economics - Issue 34 (2009) 30 financial intermediation plays a growth-supporting role (for the survey see Levine (1997), Thiel (2001) and Ang (2008)). Among financial intermediaries, in performing functions of financial system insurance companies play important role. They are main risk management tool for companies and individuals. Through issuing insurance policies they collect funds and transfer them to deficit economic units for financing real investment. Therefore, according to the theory insurance sector could be one of the factors contributing to economic growth. Insurance sector in transition countries is growing in importance. Life insurance penetration in transition European Union members in the period between 1998 and 2013 grew from 0.4 to 1.5 percent of GDP in average. In the same period non-life insurance penetration grew from 1.5 to 2 percent of GDP in average. Despite increasing importance insurance sector has hardly been investigated in its role in economic growth in transition countries. The aim of this work is to examine empirically if the insurance sector plays a growth-supporting role. Our sample consists of 10 transition European Union member countries in the period from 1998 to 2013. As proxy of insurance sector development we use insurance penetration (insurance premiums in relation to GDP). We apply fixed-effects panel model and at first stage we use ordinary least squares estimation method. In order to control for endogeneity at the next stage we estimate parameters of the model using two stage least squares method. In both cases we control for other determinants of economic growth. The paper is organized as follows. Section 2 discusses possible contributions of insurance
Development to economic growth based on the theory of financial intermediation and endogenous growth theory. Section 3 gives the review of the empirical studies on the insurance-growth nexus. In section 4 we present
data and methodology. The results of the empirical research are given in section 5. The paper finishes with some concluding remarks and suggestions for the future work that are outlined in section 6.

2. Functions of Insurance Companies and Economic Growth

Insurance companies, as a part of financial system, fulfill a number of financial system's functions, and through certain channels that are recognized due to the development of endogenous growth models, could contribute to economic growth. Contemporaneous literature on the linkage between financial development and economic growth combine the theory of financial intermediation and two views of the endogenous growth theory.

2.1 Theory of Financial Intermediation and Endogenous Growth Theory

In order to explain arguments for existence of financial intermediaries, the theory of financial intermediation adds specific frictions to models of resource allocation based on the perfect market. Namely, if there is the perfect market, all the traders are price takers, there is no private information, and allocation of resources is Pareto optimal. Thus, in a pure neoclassical framework there is no role of financial intermediation to add value. But, according to the traditional theory of financial intermediation the real-world market is characterized by frictions that include transaction costs and asymmetric information. The reduction in transaction costs, as the main function of financial intermediaries, was first introducedby Gurley and Shaw

(1960). Financial intermediaries have an advantage over direct financing in economies of scale that result from costs shared. Additionally, large amount of funds enables financial intermediaries to be more easily diversified than individual economic units. An alternative argument for the existence of financial intermediaries is information asymmetry that was first suggested by Leland and Pyle (1977). According to their theory, financial intermediaries are information collectors of borrowers' financial prospects ex-ante for solving the problem of adverse selection. Financial intermediaries can signal their informed status by investing their wealth in assets about which they have special knowledge. Diamond (1984) suggests that 31International Research Journal of Finance and Economics - Issue 34 (2009) financial intermediaries act as delegated monitors to overcome ex-post asymmetric information and in that way reduce the problem of moral hazard. Because of the changes in financial environment related to dere gulation, improved provision of information through technological progress, and financial innovation, which have been resulted in reduction of transaction and information frictions, while at the same time financial intermediation has been growing; Allen and Santomero (1998) suggest improvements in the traditional theory of financial intermediation. According to their view, the theory should also take into account risk management activities of financial intermediaries and reduction of participation costs. In order to encompass both traditional financial intermediation theory and the changes in the financial environment, and to understand the role of insurance companies in financial system and their contribution to economic growth, we are going to use the functional approach to the financial system proposed by Merton and Bodie (1995). They emphasize six core functions: the provision of means for clearing and settling payments to facilitate exchangeof goods, services and assets, the provision of a mechanism for the pooling of resources and the subdivision of shares in various enterprises, resource allocation, provision of means of risk managing, providing price information to help coordinate decentralized decision-making in various sectors of the economy, providing means to deal with the incentive problems created when one party to a financial transaction has information that the other party does not, or when one party acts as an agent of the other. For the purpose of analyzing insurance companies in the context of their contribution to economic growth, these functions could be expressed as insurance, resources accumulation and their allocation with managing various financial risks and facilitation of exchange. By realization of these functions insurance companies could contribute to economic growth. Linking of financial intermediaries' functions, and thereby functions of insurance companies too, and economic growth, was enabled by the development of endogenous growth theory. In order to show the channels through (which) financial development affects economic growth we follow Pagano (1993). According to the endogenous growth "AK" model economy produces a single good and aggregate output Y in period t is function of the aggregate capital stock K: $Yt=AKt$ (1) with A being marginal productivity of capital. The capital stock in the period t is $Kt=It-1+ (1-\delta)Kt-1$(2) with I investment that is equal to non-consumed good that depreciate at the rate δ per period. The capital market equilibrium condition requires that gross saving equals gross investment. Since one part of saving $(1-\varphi)$ is lost in the process of channeling of savings to investment, the funds available for investment are:

$\varphi St-1=It-1$ (3)

The growth rate g at time t is $gt=(Yt/Yt-1)-1=(Kt/Kt-1)-1$. Using equations (2) and (3) the steady-state growth rate is

$g=As\varphi-\delta$ (4)

With s symbolizing saving rate (S/Y).

The model shows three channels from financial development to economic growth: the marginal productivity of capital, the proportion of saving funneled to investment, and the savings rate. The other view of the theory of endogenous growth, namely the Schumpeterian could add, to the above mentioned channels that connect financial intermediation to economic growth, another one, the rate of technological innovation. Since the insurance companies act as financial intermediaries, the same channels connect their functions with economic growth.

2.2 Insurance and Economic Growth

Providing protection, insurers could affect economic growth through the channels of marginal productivity of capital, technological innovations and saving rate. Insurance companies indemnify the capital formation consists of outlays on additions to the fixed assets of the economy plus the net changes in the level of inventors. The expected sign of the coefficient is positive. A positive sign is also expected for the coefficient of education variable. Education accounts for human capital. Although there are a number of measures of the education variable, in the empirical studies of determinants of economic growth, the most commonly used measures are primary or secondary enrollments. We use secondary enrollment, which indicates the total number of children of secondary school age enrolled as a proportion of the total number of children of secondary school age. The next variable used in our research as a determinant of economic growth is openness. As a measure of openness, we use the exports of goods and services in relation to GDP. We expect that exports are positively related to economic growth. The last variable used to control for other influences on economic growth is the inflation rate. It is used to account for monetary discipline. It is expressed by the GDP deflator (annual percentage). With this variable, we expect a negative correlation with economic growth.The model we use in our research is the fixed-effects model for the next three model specifications:

$itkititCLIy\varepsilon\theta\beta\alpha+++=\sum=82$ (1)

$ititkkititCNLIy\varepsilon\theta\beta\alpha+++=\sum=82$ (2)

$ititkkititCTIy\varepsilon\theta\beta\alpha+++=\sum=82$ (3)

With subscripts i denotingcountry and t denoting time.α is the intercept term. Yit is the dependent variable representing the growth rate of GDP per capita. LIit, NLIitand TIit represent insurance variable - life insurance, non-life insurance and total insurance respectively. Cit is the vector of observations on the control variables that include private credit, stock

capitalization, level of economic development, education, openness and inflation. B and θ are the vectors of coefficients to be estimated on the explanatory variables. The disturbance term is εit~N.I.D. (0,σ2) .Before running the regression an Im, Pesaran and Shin (IPS) panel unit-root test was employed to test the stationarity of the variables in order to avoid the spurious regression. The results of the unit root test are presented in Table 2. While the null hypothesis of the unit-root was strongly rejected for four out of the eleven variables, the obtained results indicate that there was a unit root in life insurance, non-life insurance, insurance total, private credit, stock capitalization, GDP per capita and education. To solve the problem of non-stationarity, the series were nced.

Table 2 *Unit Root Test*

Variable	t value	p value
Economic growth -	5.81469	0.00000
Life insurance	0.13548	0.55390
Non-life insurance	0.81540	0.79260
Insurance total	0.04772	0.51900
Private credit	1.28398	0.90040
Stock capitalization	0.40168	0.65600
GDP per capita	4.45933	1.00000
Investment	4.09281	0.00000
Education	1.60266	0.94550
Openness	2.10222	0.01780
Inflation	64.60910	0.00000

At the first stage the parameters are estimated by ordinary least squares (OLS). But, the equations estimated using OLS ignore the effects in other direction. Since there is a possibility of International Research Journal of Finance and Economics - Issue 34 (2009) 38 reverse causality between insurance development and growth, in the next stage we extend analysis to the estimation by using instrumental variables that accounts for some endogeneity in the explanatory variables. We apply two-stage least squares (2SLS) estimators. As instruments, we use one-period lagged regressors. In order to estimate the regressions with heteroscedasticity robust standard errors we use White's modified standard error estimates in all specifications.

3. Empirical Results

The estimates of the parameters of the models for three specifications are presented in the following tables. Table 3 presents parameters estimated using OLS, while the coefficients estimated by 2SLS are reported in Table 4. According to the results for the first model specification the life insurance variable enters positively in growth equations, but it lacks significance. The coefficients of all control variables, but education, have the expected sign and they are significant. The non-life insurance ariable's parameter in the second model specification is positive and significant and the same is true for the coefficient of total insurance variable in the third model specification. The results confirm theoretical literature on the linking between insurance development and economic growth. Regarding the control variables, all coefficients have expected sign and they are significant, except of private credit and education in the third specification.

Table 3 *Estimation Results - OLS*

Dependent variable: economic growth						
Explanatory variables	(1) -0.04557***	(2) -0.04003***	(3)-0.04389***			
Constant	(0.01300)	(0.00623)	(0.01093)	0.58666		
Life insurance	(0.45450)	1.73595***				
Non-life insurance	(0.34365)	0.46818***				
Insurance total	(0.18502)	0.05303*	0.00005	0.04002		
Private credit	(0.02997)	(0.03584)	(0.02780)	0.04303*	0.04521***	0.04639**
Stock capitalization	(0.02322)	(0.01770)	(0.01996)	0.00018***	0.00021***	0.00019***
GDP per capita	(0.00001)	(0.00001)	(0.00001)	0.10872***	0.07423***	0.10516***
Investment	(0.02333)	0.01929	(0.02268)	0.04209	0.11637***	0.04774
Education	(0.03189)	0.02594	(0.03328)	0.04478**	0.04334***	0.04165**
Openness	(0.01805)	0.01052	(0.01627)	-0.00740***	-0.00979***	-0.00759***
Inflation	(0.00098)	0.00076	(0.00095)			
Adjusted R-squared	0.91365	0.93670	0.91518			
F-statistic	25.08056	38.48818	25.55819			
Prob (F-statistic)	0.00000	0.00000	0.00000			
Durbin_Watson stat	1.71647	2.09293	1.67972			

Standard errors in parentheses. ***, **, * denote statistical significance at the 1, 5, 10 percent level Regarding coefficients estimated using instrumental variables that accounts for endogeneity in the explanatory variables, all insurance variables 'coefficients have significant positive signs. Life insurance is significant at 5 per cent level, while both non-life and total insurance are significant at 1% level. Regarding the control variables, all of the coefficients, except for private credit in the second specification, have the expected sign. Insignificance of private credit variable in the most of the specifications could suggest that banks and insurance companies' financial intermediation are substitutes.

Table 4 *Estimation Results - 2SLS*

Dependent variable: economic growth						
Explanatory variables	(1) -0.06220**	(2) -0.05297***	(3) -0.05656***			
Constant	(0.02723)	(0.00913)	(0.02402)	0.87451**		
Life insurance	(0.41427)	1.93695***				
Non-life insurance	(0.45220)	0.53084***				
Insurance total	(0.18501)	0.06098*	-0.02411	0.04335		
Private credit	(0.03298)	(0.04240)	(0.03059)	0.03400	0.03238	0.03770
Stock capitalization	(0.02762)	(0.02062)	(0.02614)	0.00017***	0.00020***	0.00017***
GDP per capita	(0.00002)	(0.00001)	(0.00002)	0.06311	0.07791**	0.04846
Investment	(0.07094)	(0.03798)	(0.06632)	0.02329	0.12614***	0.02825
Education	(0.03499)	(0.02182)	(0.03625)	0.10402***	0.07004***	0.09859***
Openness	(0.03939)	(0.01733)	(0.03592)	-0.00931***	-.011694***	-0.00978***
Inflation	(0.00198)	(0.00183)	(0.00171)			
Adjusted R-squared	0.90019	0.95850	0.90073			
F-statistic	23.44861	36.82380	24.45588			
Prob (F-statistic)	0.00000	0.00000	0.00000			
Durbin Watson stat	1.77918	2.03372	1.69051			

Standard errors in parentheses. ***, **, * denote statistical significance at the 1, 5, 10 percent level

4. Summary and Concluding Remarks

Using endogenous growth model and panel data estimation techniques we examined whether life and non-life insurance, individually and collectively contribute to economic growth across sample of 10 transition European Union member countries in the period from 1992 to 2007.According to our results insurance development promotes economic growth. Thus, functions of insurance companies - providing means of risk management and performing mobilization and allocation of resources - are important for economic growth. The results are confirmed in terms of life and non-life insurance, as well as, total insurance, even after controlling for other determinants of economic growth and endogeneity. These study findings are consistent with the rguments of finance-growth nexus theory. The findings could be suggestive for insurance sector's policy makers. The key is to implement the policies that are going to provide institutional improvements, encourage competition, and contribute to increasing efficiency, especially in risk management, and product development of insurance companies. Countries that are concerned with demographic challenges and problems with social security system should continue to implement incentives for stimulating more participation of insurance companies in providing the private supplement to public pension and healthcare pillars. With International Research Journal of Finance and Economics - Issue 34 (2009) 40 all of these improvements, insurance sector would have more potential to contribute to economic growth.

In the future research of insurance-growth nexus, besides insurance penetration, insurance development could be measured by insurance density and by the assets of insurance companies. Regarding estimation techniques future work could apply generalized method of moments for dynamic models of panel data thatalso control for endogeneity. Moreover, in dependence of availability of data, in the future research more transition countries could be added in sample.

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6. Appendix

Source of the Data on the Variables used in the Regression Analysis Variable Sources

Gross domestic product World development indicators (WDI) database, World Bank Insurance (life, non-life, total) Sigma, Swiss Re Economic Research & Consulting, Swiss Re, Zurich Pye (2003) National insurance supervisory authorities for the part of the countries.

Private credit Financial structure database, World bank Transition Report, EBRD Stock capitalization Financial structure database, World bank Transition Report, EBRD Investment World development indicators (WDI) database, World Bank Education Ed Stats, World Bank

Export International Financial Statistics, IMF, line 90c World development indicators (WDI) database, World Bank Inflation World development indicators (WDI) database, World Bank