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# **Does Insurance Development Affect the Financial Markets in developing countries?**

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**Abstract**

This paper investigates the impact of insurance premiums on stock market development in 37 developing countries over the period 1987-2011. By controlling for the potential endogeneity bias, using the System GMM estimator, we show that the insurance premiums significantly increase the stock market total value traded. This result is robust to the use of alternative measure of stock market development and control of the political and legal system quality. In addition, the results highlight that an improvement in property rights promotes the deepening of the financial market. Thus, the results argue for insurance policies promoting and an improvement of the legal environment to benefit from the financial market development.

**Key words:** Stock market, Insurance Premiums, Developing countries.

**JEL codes:** G10, G22

## **1. Introduction**

Since the UNCTAD report (1982) showing the importance of the insurance promotion for the economic development in developing countries, several studies have addressed this issue as well in the developed and developing countries. Most of these studies have analyzed the insurance effect on economic growth (Webb and al., 2002; Ward and Zurbruegg, 2000; Arena, 2008, Avram and al., 2010; Outreville, 2011; Chang and Lee, 2012) and the direct effect of insurance on financial markets development has been less analyzed. However, the insurance companies just like the others institutional investors may not only help to improve the allocation of capital, but also further strengthen their investments through enhanced surveillance (Masci and al, 2007). Capital markets may also be a driving force the benefit of the institutional investor's development. Given that, the insurance companies have the responsibility compositions that are for the mostly long-term, with the liquidity needs, they are a natural complement for the capital markets development (Masci and al, 2007). Furthermore, the insurance companies have large cash inflows and reserves (linked to the payment of premiums), which may to be partly be invested in less liquidity instruments as bonds and equities. In the context, the development of insurance services plays a primordial role in the financial markets development through the risk management, the savings allocation and the market growth.

The literature have showed that the development of contractual savings activities (pension funds and insurance companies), which constitute the main institutional investors, contributes to the financial markets development (Viattas; 1998, Catalan and al.; 2000). Indeed, the contractual savings development can have at once a direct and indirect impact on the financial market development. The direct impact is linked to the modification of the composition of the supply of funds in the economy: the relative supply of funds increases in the long term, which translates into an increased demand for the instruments of the market capital. Thus, the contractual savings development promotes depth and liquidity in capital markets, and it improves the financial structure of enterprises and governments by increasing the equity to debt ratio and by lengthening the maturity of debt (Impavido and Musalem, 2000). As the indirect impact, the institutional investors development can train an improving the efficiency of the financial market by encouraging the other financial intermediaries and the corporate sector to more specialization and professionalism (Dickinson, 2000). As the insurance development allows, inter alia, to better manage risk, including financial markets, and thus improves the allocative efficiency in the economy (Pagano, 1993).

Furthermore, there are a few empirical studies on the relationship between the assets generated by the contractual savings institutions and the financial market development in some OECD and emerging countries (Catalan and al., 2000 and Impavido and al., 2003). Indeed, Catalan and al. (2000) found that the life insurance and pension funds development Granger-cause the capital markets development in the OECD countries. Regarding Impavido and al., (2003); they showed firstly that an increase in assets of contractual savings institutions relative to assets of the domestic financial system has a positive impact on the deepening of stock and bond markets. Then, the impact of contractual savings development on the stock market development is amplified in countries where the information on the companies is more transparent. Finally, they highlighted a significant heterogeneity between countries as a function of the nature of their financial system.

However, though the previous studies bring a significant contribution to the analysis of the effects of the insurance companies development on the capital market, they are not exempt from criticism. First, they do not take into account the developing countries which the two systems (insurance and financial markets) are experiencing a significant evolution and constitute an important potential sources of long-term financing. Secondly, the previous studies do not distinguish between the effect of the different contractual savings companies (insurance and pension funds) on the stock market development while unlike to the developed countries, in the developing countries the insurances are more developed than the pension funds.

The goal of this paper is to contribute of the literature by showing empirically that the insurance activities development affect the financial market development. Thus, we analyze the impact of the insurance activities development on the stock market transaction value in a sample of 37 countries over the period 1987-2011. Indeed, the OECD report (2014) on the cooperation for the development has shown that contractual savings companies constitute a potential source for the long-term financing. Thereby, we think that, this study will allow us to prove empirically whether the insurance sector development contributes effectively to the functioning of stock markets in developing countries. Finally, unlike to the existing literature (Catalan and al., 2000 and Impavido and al., 2003), we also try to control the quality of institutions and legal system in the stock markets development. This is justified in the literature (La Porta and al, 1998) who showed that the financial system is developing rapidly in countries where there is more of the protection of investor rights and an independence of the judicial system in the settlement of commercial disputes.

The rest of the paper is articulated as follows. The section 2 shows the econometric model and the estimate strategy. The section 3 presents the data of the study. The section 5 is consecrated to the interpretation the mains results and the last section concludes the paper.

## 2. Empirical approach

Does insurance penetration (i.e. insurance premiums to GDP) affect the stock market development? To understand the impact of insurance development on the stock market development, we estimate the following regression:

$$\text{Stocktra}_{i,t} = \alpha + \beta_1 * \text{INS}_{i,t} + \beta_2 * X_{i,t} + \eta_i + \varepsilon_{it} \quad (1)$$

Where,  $\text{Stocktra}_{i,t}$  is a measure the financial market development level and  $\text{INS}_{i,t}$  is the proxy for insurance sector development for the country  $i$  in period  $t$ .  $X$  represents a vector of the control variables identified in the literature as determinants of the stock market.  $\alpha, \beta_1$  and  $\beta_2$  are unknown parameters to be estimated.  $\eta$  and  $\varepsilon$  are country fixed effects and the idiosyncratic error term, respectively.

In line with the empirical work of the factors of financial market development (Yartey, 2008), we control for the Initial real GDP per capita, the domestic investment to GDP, the ratio of domestic credit allocated to private sector to GDP, the inflation, the real interest rate and foreign direct investment as a percentage of GDP (FDI). Unlike previous studies, we also control the quality of institutions and the legal system by the protection of Property Rights, Legal System and Property Rights and Rule of Law<sup>1</sup>. Control variables are from World Development Indicators (WDI) and the indicators of the quality of intuitions come from Economic Freedom of the World Index, Fraser Institute and International Country Risk Guide (ICRG).

The estimate of our equation (1) above runs against to the traditional problems of endogeneity, originating from of the simultaneity bias. Indeed, the insurance development could be also influenced by the stock market development; for example a stock market development could improve the financial results of the insurance companies and lead to an increase of their activities: which increases the confidence of economic agents to consume the assurance. In order to control this potential simultaneity bias, we estimate the equation of the stock market

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<sup>1</sup> These variables are used interchangeably in the regressions. The Legal System and Property Rights, measure of the quality of a country's legal system and protection of property rights is from the Economic Freedom of the World Index, Fraser Institute.

development well as his transformation in first differences as a system of equations by using the System GMM estimator developed by Blundell and Bond (1998)<sup>2</sup>.

Indeed, the System GMM estimator allows not only to take into account the heterogeneity of countries, but also to treat the problem of endogeneity of variables that may arise in our relationship between stock market development and insurance penetration. This estimator consists to combine for each period the equation in levels and the equation in first differences which allows for the use of lagged differences and lagged levels of the explanatory variables as instruments (Blundell and Bond, 1998). We use the Windmeijer (2005) finite-sample correction to the standard errors in two-step estimation. The instrumentation procedure was performed so as to limit the problem of too many instruments (Roodman and al., 2009)<sup>3</sup>.

The Panel data are the averaged over nonoverlapping five-year on the period 1987-2011 as follows: 1987-1991, 1992-1996, 1997-2001, 2002-2006 and 2007-2011. This approach has been also used by Beck and Levine (2004). Furthermore, in our estimates, we estimate the impact of insurance on the stock market on whole the period (1987-2011) and the period before the financial crisis (1987-2006). The estimation of the insurance effect on the financial market before the crisis is justified by the fact that the financial crisis has mainly affected the financial market and banking. Thus, given that the stock market has experienced a crisis, the insurance effect on this latter could be more influenced by the financial crisis that enabled the insurance companies to develop by proposing of savings products less volatile.

### **3. Data and summary statistics**

This section describes the variables and provides the summary statistics (see Table 1). In this study, we use the stock market transaction ratio which is equal the stock market total value traded to GDP. It is an indicator of deepening of financial market and measure the liquidity of stock market by relative to the size of economy. This indicator has the advantage to take into account both the size and activity of the stock market (Čihák and al., 2012). Thus, it is used as a good proxy for the stock markets development. Regarding to the indicator of insurance activities development, it is expressed by the total premiums to GDP. It measures the total revenue of insurance companies' relative the economy activity. These two indicators of the stock market

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<sup>2</sup> GMM stands for Generalized Method of Moments

<sup>3</sup> Too many instruments may overfit endogenous variables leading to a failure in expunging their endogenous components.



and insurance development are derived from the Benchmarking financial systems around the world developed by Čihák et al (2012).

Table 1 presents the descriptive statistics of our different variables in our sample of 37 developing countries which are used in our estimations. We observe that the average of stock market transactions ratio represents 6.71 times the insurance penetration. Regarding the average the bank credit ratio, it represents more than 16 times the insurance penetration and more than 2 times the stock transactions ratio. These show that the insurance sector is poorly developed in relation to other financial institutions (banks and stock markets). As indicated in the table1, there are of significant variations in the financial market transaction ratio in different countries. For example in the course of the period 1987-2011, the stocks traded ratio on the stock market ranged from 0.0116% of GDP in Bolivia to 200.8311% of GDP in Singapore. In return, the insurance penetration rate varies from 0.166% of GDP in Bangladesh 17. 469% in South Africa over the same period.

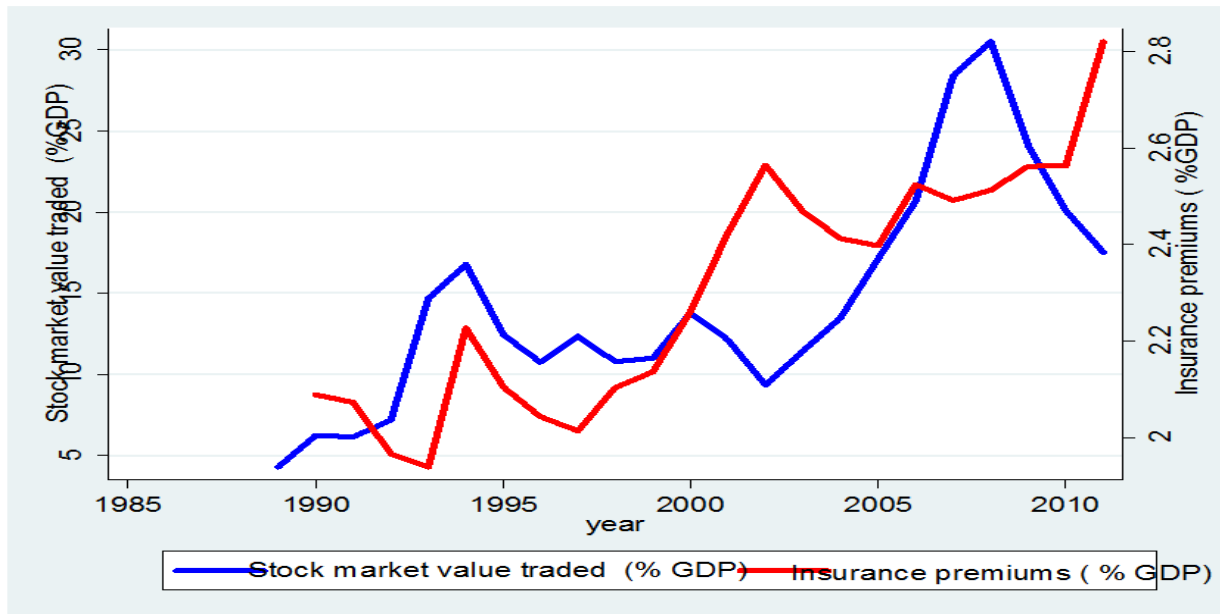
**Table 1:** Summary statistics

Variables	Obs	Mean	Std. Dev.	Min	Max
Stock market total value traded (% GDP)	760	15.3429	29.5049	0.0116	200.8311
Insurance Premiums (% GDP)	735	2.2863	2.3156	0.166	17.469
Domestic investment (% GDP)	931	21.4512	6.5289	5.4589	45.9602
Private credit by deposit money banks ( % GDP)	912	38.4634	30.5436	2.0848	165.8018
Real interest rate	733	7.9709	12.4303	-58.3547	78.7899
FDI (%GDP)	938	3.0963	3.7916	-12.2084	27.8737
Property Rights	413	5.0864	1.5919	1.1666	9.2043
Legal System and Property Rights	512	5.2803	1.3422	1.9532	8.9683
Rule of Law	852	3.2146	1.2477	0	6

The figure 1 shows the evolution of the stock market total value traded to GDP and insurance premiums as a percentage of GDP in the sample countries. One notices the two curves have similar evolutions serrated with an increasing general tendency during the period of study. This situation shows that the two financial sectors are sensitive to the economic situations of countries. Indeed, we observe an increase of stock market transaction after the years 2000 until know a strong decrease in early 2008 following the financial crisis. However, the insurance penetration knows a growth despite the crisis. This situation of the insurance sector may be explained by several arguments. Firstly, the increase of the insurance penetration rate may be caused by the decline in GDP following the 2007 crisis, leading to a mechanics increase of the insurance premiums to GDP. Then, the insurance sector could develop because the stock and banking market is in crisis: the insurance companies stronger and less affected (by their nature) by the stock market fluctuations could benefit from the crisis on the stock market by providing

the products less volatiles. Finally, one can also think that the increase of the insurance activities is explained by economic growth in developing countries especially in emerging countries leading to an increase of the insurance demand.

**Figure 1:** Stock market value traded to GDP and Insurance premiums to GDP (1987-2011).



#### 4. The results of the estimations

The results of the estimations are presented in the table 2. Thus, columns 1 to 4 have been estimated by considering the period from 1987 to 2011 and columns 5 to 8 for the period 1987-2006. Consistent with the findings of earlier empirical studies (Impavido and al., 2003), the regressions results in Table 2 show that countries with higher levels of insurance sector development experienced higher levels of stock market development over the period 1987-2011<sup>4</sup>. The coefficient of insurance penetration ranges from 3.090 to 4.097 and from 4.219 to 5.449 for the period 1987-2011 and 1987-2006, respectively. Indeed, the positive effect of the insurance premiums in all the regressions means that the insurance development contributes to the stock market development in developing countries. Thus, the increase in insurance premiums allows the insurance companies to have sufficient resources for long-term investments and detain the less liquid assets in their portfolios; which contributes to improve the stock trading.

<sup>4</sup> The diagnostic statistics are favorable. The Hansen test of overidentification, which is robust to heteroscedasticity, does not reject the validity of instrumental variables used and the Arellano and Bond test rejects the second order serial correlation

The control variables, only domestic investment has a positive and significant effect in the period from 1987 to 2011 (column 2, 3 and 4). This suggests that, on average, the countries with domestic investments rise have tendency to experience the higher levels of stock trading that the countries with the less investments.

**Table 2:** The impact of insurance development on financial market

Dependent Variable: Stock market total value traded (% GDP)	Averaged over fixe nonoverlapping five-year periods between 1987 and 2011				Averaged over five-year periods between 1987 and 2006			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Lagged dependent	0.807*** (0.186)	0.792*** (0.203)	0.703*** (0.166)	0.826*** (0.138)	0.769*** (0.231)	1.015*** (0.341)	0.825*** (0.277)	0.879** (0.353)
Insurance Premiums (%GDP)	3.090*** (0.968)	3.753*** (0.953)	3.677*** (0.960)	4.097*** (0.823)	4.219* (2.271)	5.449** (2.616)	4.756** (2.174)	4.920** (2.149)
Initial GDP per capita	-0.0008 (0.0007)	-0.0002 (0.0011)	0.0007 (0.0019)	9.58e-05 (0.0009)	-0.0003 (0.0004)	0.0004 (0.0014)	0.0017 (0.0029)	0.0001 (0.0009)
Investment		1.754* (0.874)	1.778** (0.835)	1.763** (0.864)		1.880 (1.528)	1.906 (1.362)	1.226 (1.705)
Private credit (% GDP)		-0.155 (0.176)	-0.0421 (0.138)	-0.268 (0.197)		-0.473 (0.507)	-0.254 (0.394)	-0.212 (0.534)
Inflation		-0.0018 (0.002)		0.0013 (0.0033)		-0.0017 (0.003)		-0.0007 (0.005)
Real interest rate			0.0896 (0.153)				0.0252 (0.260)	
FDI				1.261 (0.863)				0.111 (1.746)
Constant	3.118 (3.970)	-32.16** (15.45)	-38.51** (15.91)	-34.29** (15.18)	-1.886 (3.144)	-29.28 (28.30)	-38.41 (27.05)	-23.80 (27.58)
Observations	113	113	92	113	80	80	66	80
Countries	33	33	29	33	32	32	28	32
AR(1):p-value	0.074	0.082	0.040	0.061	0.091	0.089	0.029	0.090
R(2):p-value	0.330	0.187	0.284	0.177	0.311	0.179	0.261	0.238
Hansen OID test: prob.	0.145	0.120	0.371	0.169	0.574	0.139	0.106	0.305
Instruments	24	26	26	27	15	17	17	18

**Note:** The estimation method is the two-step System-GMM method with the Windmeijer (2005) correction for finite sample bias. Robust standard errors are reported in parentheses. AR (1): and AR (2): denote the Arellano and Bond statistics tests for lack of one-order and second-order serial correlation, respectively \*  $P < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . All the variables of the model are assumed to predetermined and instrumented by their delays at most 5 periods.

We also explore the robustness of our results by controlling the effect of the legal system quality on the stock market development using always the system GMM estimator. The results are presented in Table 3. The results with the control variables of the legal system quality are robust because we find the positive effect of the insurance on the stock market development in all the regressions (column 1 to 6). Moreover, we observed that, the protection of property rights has a positive and significant impact on stock market (column 1 and 4) while the index of the legal

system and property rights and rule of law have not the significant effect. Thus, the positive impact of the index of property rights (column 1 and 4) confirms that the stock market development just like the others financial services (insurance, pension funds, banks) requires a good legal framework which supports property rights (Avram and al, 2010). The underlying theory is that in countries with more secure property rights, firms might allocate resources better and consequently grow faster as the returns on different types of assets are more protected (Claessens and Laeven, 2003).

**Table 3:** robustness: control of the legal system quality.

Dependent Variable: Stock market total value traded (% GDP)	Averaged over fixe nonoverlapping five-year periods between 1987 and 2011.			Averaged over fixe nonoverlapping five-year periods between 1987 and 2011.		
	(1)	(2)	(3)	(4)	(5)	(6)
Lagged dependent	0.611*** (0.140)	0.709*** (0.205)	0.773*** (0.167)	0.759*** (0.192)	0.814*** (0.245)	0.498** (0.218)
Insurance Premiums (%GDP)	1.762** (0.826)	3.365*** (1.022)	3.333*** (0.742)	2.629 (2.383)	4.280** (1.871)	2.745*** (0.512)
Initial GDP per capita	-0.0020** (0.0009)	-0.0005 (0.00085)	-0.0002 (0.0005)	-0.00273** (0.0012)	-5.40e-05 (0.0006)	-0.0005 (0.0006)
Investment	0.832 (1.401)	1.070 (0.886)	1.544** (0.725)	-0.873 (1.469)	0.529 (1.100)	1.196 (0.917)
Private credit (% GDP)	-0.128 (0.120)	0.0443 (0.077)	-0.100 (0.136)	-0.210 (0.190)	-0.0253 (0.103)	-0.0220 (0.247)
Inflation	0.165 (0.641)	-0.00014 (0.0032)	-0.0057 (0.0043)	0.0323 (0.472)	-0.00055 (0.0029)	-0.0063 (0.0047)
Property Rights	12.20*** (2.334)			9.527* (4.835)		
Legal System and Property Rights		-0.336 (3.423)			-1.924 (3.397)	
Rule of Law			0.0117 (2.703)			0.629 (3.117)
Constant	-65.29** (31.31)	-21.21 (16.74)	-27.94** (12.25)	-11.27 (28.00)	-4.166 (18.01)	-21.47 (14.73)
Observations	67	112	107	37	79	76
Number of id	30	33	31	24	31	30
AR(1):p-value	0.044	0.092	0.040	0.025	0.084	0.020
R(2):p-value	0.935	0.240	0.146	0.829	0.269	0.139
Hansen OID test: prob.	0.130	0.154	0.167	0.453	0.260	0.139
Instruments	24	28	27	15	19	18

**Note:** The estimation method is the two-step System-GMM method with the Windmeijer (2005) correction for finite sample bias. Robust standard errors are reported in parentheses. AR (1): and AR (2): denote the Arellano and Bond statistics tests for lack of one-order and second-order serial correlation, respectively \* P < 0.1, \*\* p < 0.05, \*\*\* p < 0.01. All the variables of the model are assumed to predetermined and instrumented by their delays at most 5 periods. The Legal System and Property Rights, measure of the quality of a country's legal system and protection of property rights is from the Economic Freedom of the World Index, Fraser Institute.

The second analysis of robustness considers an alternative measure of stock market development, namely the stock market capitalization to GDP. Contrary the stock market total value traded to GDP which measures the stock market liquidity, market capitalization represents the size of the stock market in domestic economy. This measure is equal to the value of listed shares divided by GDP. The market capitalization as a percentage of GDP was used in several empirical studies as a proxy of the stock market development (see Levine and Zervos, 1998; Boyd and al., 2001; Beck and Levine, 2004). As for the stock market total value traded to GDP, there is wide variation in stock market capitalization to GDP ranging from less than 0.1909% in Latvia to more than 328.8763% in Malaysia during the period from 1987 to 2011

**Table 4:** Robustness: Alternative measure of stock market development.

Dependent Variable: Stock market capitalization (GDP)	Averaged over fixe nonoverlapping five-year periods between 1987 and 2011.				Averaged over fixe nonoverlapping five-year periods between 1987 and 2011.			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Lagged dependent	0.346** (0.131)	0.276*** (0.095)	0.256** (0.0969)	0.170* (0.096)	0.106 (0.0842)	0.0844 (0.053)	0.0663 (0.0547)	-0.0173 (0.0956)
Insurance Premiums (%GDP)	10.27** (3.865)	6.551*** (1.898)	7.065*** (1.773)	5.334*** (1.844)	14.48** (5.538)	9.523*** (3.411)	9.867*** (3.341)	7.407** (3.019)
Initial GDP per capita	-0.002** (0.0009)	- (0.0008)	-0.00154 (0.0019)	-0.0024** (0.0010)	-0.0016 (0.0010)	-0.0019** (0.0008)	-4.27e-06 (0.002)	-0.0014 (0.0011)
Investment		-0.903 (0.664)	-0.283 (0.689)	1.754* (0.875)		-1.103 (0.714)	-0.550 (0.627)	2.326** (1.060)
Private credit (% GDP)		0.666** (0.243)	0.690** (0.288)	1.170*** (0.372)		0.745** (0.279)	0.767** (0.334)	1.363** (0.509)
Inflation		0.0871 (0.166)		-0.0051 (0.006)		0.137 (0.206)		-0.0109* (0.0060)
Real interest rate			0.159 (0.232)				0.226 (0.186)	
FDI				1.348 (2.249)				0.236 (2.774)
Constant	9.100 (8.527)	10.45 (12.80)	-8.114 (17.35)	9.501 (13.42)	0.687 (11.85)	4.221 (16.69)	-14.39 (17.76)	14.31 (14.72)
Observations	111	111	91	111	78	78	65	78
Countries	33	33	29	33	32	32	29	32
AR(1):p-value	0.033	0.015	0.057	0.085	0.054	0.032	0.104	0.122
R(2):p-value	0.150	0.115	0.137	0.227	0.174	0.159	0.156	0.885
Hansen OID test: prob.	0.150	0.226	0.542	0.289	0.432	0.230	0.176	0.326
Instruments	24	26	27	27	15	17	18	18

Note: The estimation method is the two-step System-GMM method with the Windmeijer (2005) correction for finite sample bias. Robust standard errors are reported in parentheses. AR (1): and AR (2): denote the Arellano and Bond statistics tests for lack of one-order and second-order serial correlation, respectively \*  $P < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . All the variables of the model are assumed to predetermined and instrumented by their delays at most 5 periods

The results in Table 5 show that our basic results are robust to the use of an alternative measure of stock market development. The coefficient of the insurance penetration is positive and significant in all the regressions during the period 1987-2011 and the period before the financial crisis (1987-2006). This suggests a substantial economic effect of the insurance development on the stock market development. Thus, *ceteris paribus*, an increase of 0.1 unit of standard deviation of insurance penetration leads to an increase in the stock market capitalization of 26.566% (column 4). Moreover, using the stock market capitalization to GDP as a proxy for the stock market development, the positive effect of the domestic investment on the stock market remains significant. The initial GDP per capita has a negative and significant effect on the stock market capitalization while the inflation, the real interest rate, and the FDI have not a significant effect on the stock capitalization.

## **5. Conclusion**

This paper has analyzed the impact of the insurance premiums on the stock market development from a sample of 37 developing countries over the period from 1987 to 2011. Thus, the use of the econometric estimates technique (System GMM) allows taking into account the potential endogeneity of the insurance premiums. The results show that when the insurance premiums increase, the stock transaction also increases. The positive impact of the insurance penetration is robust to control the legal system quality and to the use of an alternative measure of the stock market development. Furthermore, the legal system quality such as the protection of property rights is a significant determinant of the stock market deepening.

The conclusions of this paper have the policy implications for the developing countries. Given the evidence that the insurance has a positive relationship with the stock market development, the developing countries should undertake the policies that aim to encourage the insurance development (especially life insurance); which will allow insurance companies to mobilize the significant stable resources to finance the economy through the purchase of financial assets. In addition, the conclusions on the legal system quality suggest that an improvement of the legal framework, in particular the improvement of property rights is necessary for a country to obtain the full benefits of the insurance development on the stock market.

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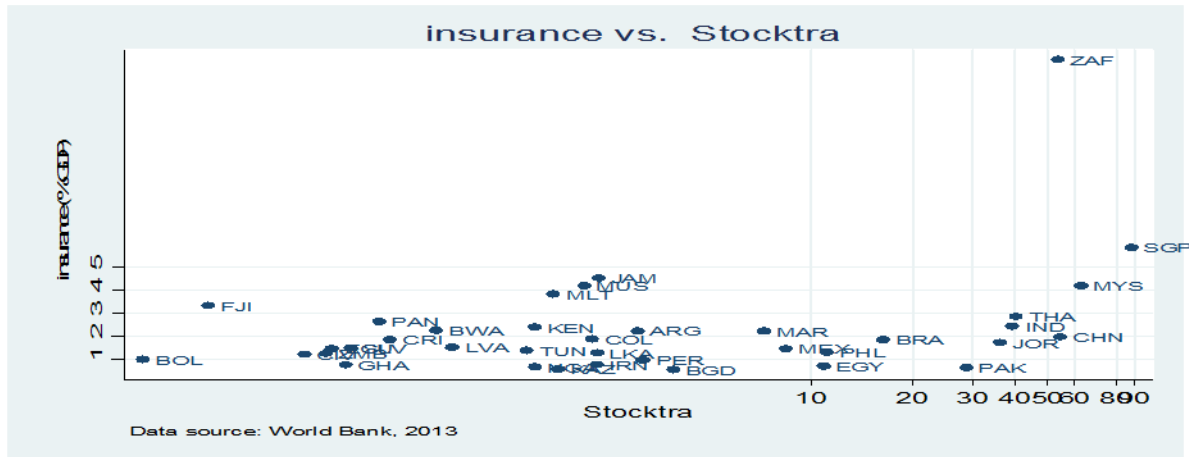
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### Appendix

**Figure A** Correlation between the stock market total value traded (% GDP) and insurance premiums (%GDP)



**List of countries:** Argentina, Bangladesh, Bolivia, Botswana, Brazil, China, Colombia, Costa Rica, Cote d'Ivoire, Ecuador, Sri Lanka, El Salvador Egypt. Arab Rep., Fiji, Ghana, India, Iran. Islamic Rep., Jamaica, Jordan, Kazakhstan, Kenya, Latvia, Malaysia, Malta, Mauritius, Mexico, Monaco, Nigeria, Pakistan, Panama, Peru, Philippines, Singapore, South Africa, Thailand, Tunisia, Zambia.