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## FINANCIAL DATA REPORTING ANALYSIS OF THE FACTORS INFLUENCING ON PROFITABILITY FOR INSURANCE COMPANIES

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Received 15 May 2019; accepted 15 February 2020; published 30 March 2020.

**Abstract.** In this article the econometric analysis of panel data for insurance companies of the Republic of Kazakhstan from with a research objective of financial figure for profitability and influencing of factors defining profitability was performed. The article reveals the indicators that affect the profitability of insurance companies in order to further forecast. Independent variables were calculated using information on insurance companies of the Republic of Kazakhstan available in the public domains, mainly data from financial statements. The author reaches to prove that the data on insurance companies' obligations exert special influence on the evaluation of the profitability of the insurance company. The article suggests a methodical approach to measuring financial indicators of insurance companies based on panel data models, taking into account industry and individual differences. The research is carried out using the Gretl software package. Panel data models with fixed effects, panel data models with random effects were applied, and the most effective model was selected by the Hausman Test. As a result, it is proved that the profitability of the insurance company is affected by three indicators, two of which are calculated on the financial statements, including the financial leverage. This allows us to use these indicators in further forecasting the profitability and financial stability of insurance companies. Correctness of the assessment of profitability and forecasts are influenced by the correctness of data in the financial statements. The quality of models is limited by the quality of the financial statements of companies analyzed in this article.

**Keywords:** insurance companies; profitability; profitability of insurance companies; analysis of insurance companies; panel data models with the fixed effects; panel data models with random effects; leverage; profitability forecast

**Reference** to this paper should be made as follows: Kulustayeva, A., Jondelbayeva, A., Nurmagambetova, A., Dossayeva, A., Bikteubayeva, A. 2019. Financial data reporting analysis of the factors influencing on profitability for insurance companies. *Entrepreneurship and Sustainability Issues*, 7(3), 2394-2406. [http://doi.org/10.9770/jesi.2020.7.3\(62\)](http://doi.org/10.9770/jesi.2020.7.3(62))

**JEL Classifications:** E44, G22

## 1. Introduction

In contrast to investment and the endowment funds which put the task just to keep the capital, insurance companies usually reach out for maximizing economic viability for covering future engagements. Furthermore, insurance companies are controlled process and must parallel fitness in accordance with the requirements of the regulator (Revinskiy, 2016). The most important focus of the government at insurance companies' regulation is aimed at their financial sustainability. This is the main indicator of the success of the insurance industry as a whole. While insurance is like any other businesses is aimed at making a profit. The presence of profit, that is profitability increases insurance company's stability (Pratheepan, 2014; Hilkevics, Semakina, 2019).

Achieving positive result of insurance company stands for strategic priorities in company's financial management. Research objective is the empirical analysis weight and degrees of a number of financial figures for forming profitability in homegrown insurance companies.

The econometric linear model of multivariate regression has been constructed for achieving this aim by means of Gretl software package, its specification is defined and the adequacy to the constructed model and the importance of parameters are checked. The panel data picking, rendering financial parameters of insurance companies of the Republic of Kazakhstan in seven years from 2012 to 2018 has been made. As regressors of model six variables - the size of firm, profitability of assets, possibilities for growth costing of the fixed production assets and the equipment, growth of total assets, not debt tax board and material assets are used. It is defined in the presented research that not all traditional determinants are significant when determining profitability for insurance companies of the Republic of Kazakhstan.

## 2. Research background

Majority of researches use profitability as a figure by insurance market performance. They can use it as a figure to show insurance company status (Long and Li, 2017 and Sharif et.al, 2012). Some use it as a resultative figure that means to investigate occurrences of its increase or forecasting activity (Akotey et al, 2013 and Sumaira and Amjad, 2013). Theoretically the size of profit depends only on two figures: income and expenses. However, these two figures in turn are exposed to influence by other figures of insurance companies and features of developed economy (Akotey et al, 2013, Buyinza et al., 2010 and Indranarain, 2009).mDu Jardin P. 2009 in his article analyzed figures that have been used to predict bankruptcy or distress of companies. His analysis was done on 190 papers. He found variables that better reflect companies' state. They could be divided into variables that reflect the situation in company (financial variables and variables that that represent such main characteristics as structure, strategy, management and others) and variables that shows the economic environment of the company. From 190 papers 93% used financial ratios, and 40% choose variables based on its popularity and predictive ability in previous studies. If we focus on the researches connected with insurance companies, then, the figures from the first group have been used as a close resource objectives by means connected directly with the companies. Among them there are financial figures and figures by their dynamics, and figures connected with company age. (Long and Li, 2017 Akotey et al, 2013, Sumaira and Amjad, 2013 and Sharif et.al, 2012). Badea research (2017) which investigates for 15 articles investigating insurance companies and their profitability is especially remarkable in this regard. 10 of 15 articles use as dependent variable defining company profitability by the return on assets. As independent variables in researches is often used financial leverage which is calculated on the basis of financial date reporting. Financial leverage and size of company are two most often used figures according to Badea research (2017).

We investigated also these articles and have come to a conclusion that in our case the most indicative is profitability not of assets, and profitability of sales as a profitability figure, that is we use a ratio of net profit to

net insurance premiums. We have taken some figures of financial data reporting as independent variables connected with obligations such as financial leverage and the current liquidity and have added figures of the size and age of insurance company. And on the basis of these data have decided to study extent of their influence on overall performance of insurance companies through their profitability. Thus if financial data reporting figures don't exert impact on profitability, then it will be possible to consider the fact of financial data reporting impact on efficiency is not proved. Whereas the return will be the proof of importance for these figures of insurance company profitability.

Of course, factors that affect the profitability of insurance companies are not limited to the information provided in the financial statements. There are a huge number of internal and external non-financial factors. Great impact on the activities of insurance companies can be provided by natural disasters that could cause the enormous economic and insured losses (Benali and Feki, 2017). But natural disasters are often unpredictable; therefore, within the framework of this article, we took into account the limited sources of information. Users need a system to assess the profitability and sustainability of insurance companies using data that is freely available. Therefore, the data presented in the public financial reports meet these requirements completely.

### 3. Review of the insurance market of the Republic of Kazakhstan

Development of the insurance sector stimulates business activity of a business function and also provides further expansion for insurance scope in the real sector of economy. In addition to the insurance sector stands for one of the internal funding sources for commercial banks for ensuring investment process in the real sector of economy. The tendency to develop requirements by increasing authorized capital is traced in process of developing homegrown insurance market. According to Agency Board Resolution of the Republic of Kazakhstan by-laws managing from August 22, 2008 No. 131 "About the approval of the Instruction for establishing prudential standards and other norms to regulatory compliance for the insurance (reinsurance) company and insurance group, including the minimum sizes of authorized capital, guarantee fund, a margin of solvency and terms of reports submission of implementing prudential standards" (further – the Instruction No. 131) requirements to forming authorized capital order and the minimum size of guarantee fund for insurance (the reinsurance organizations) and also the principles of requirements to solvency and financial stability for insurance companies are established. Many of these requirements have led to the reduction for number of insurance companies in Kazakhstan. As it is seen from table 1, insurance companies were 40 in 2012, was cut down to 32 in 2018 is presented by 3 insurance groups.

**Table 1.** Insurance Market Structure in the Republic of Kazakhstan

Insurance Market Structure	2012	2013	2014	2015	2016	2017	2018
The number of insurance organizations	40	38	35	34	34	33	32
<i>Those of life insurance</i>	7	7	7	7	7	7	7
The number of insurance brokers	13	14	13	14	15	15	15
The number of actuarians	70	85	82	72	71	61	59
The number of insurance organizations which are participants of AS 'Payout Guarantee Fund'	-	33	31	30	30	30	22
The number of insurance companies representatives – non resident of Kazakhstan	-	8	-	3	0	3	3

Source: compiled by authors according to Data of National Bank of the Republic of Kazakhstan, <http://www.nationalbank.kz>

Table 2 depicts the volume of insurance premiums from 2012 to 2018 is came to 1 717 533 billion tenge and the total volume of insurance benefits for analogical period is came to 380 878 million tenge. In general, the growth

of volume of insurance premiums is observed positively since 2012. For the analyzed period from 2012 to 2018 payout structure by classes of insurance was gradually changed. So, if earlier more than a half of payouts was to the fraction of property insurance, then in the last 3 years its fraction isn't up to 20%. The remained fraction in equal ones is distributed practically between obligatory and personal classes of insurance.

In obligatory insurance more than a half of payouts is attributable to (CRR) owners of vehicles, according to the Law of the Republic of Kazakhstan from July 1, 2003 No. 446- II about obligatory insurance of civil and right responsibility for owners of vehicles, and a quarter is to catastrophe insurance under labor (office) duties. In voluntary personal insurance the vast majority of payout is made under contracts of health insurance and retirement annuities.

Thus, the analysis of changing structure and growth dynamics of insurance premiums and payouts allows us to draw the further changes: the insurance sector of economy of the Republic of Kazakhstan during the period from 2010 to 2016 was at growth stage. At the same time the market developed on an extensive way, but we assume some stagnation for the market dealing with difficult macroeconomic conditions in the near mid-term. It remains heavy reliance of the insurance market of Kazakhstan on bank and material sectors of economy. However, it is necessity to note a tendency of the displaced development from corporate orientation towards retail business. If abstracting insurance market factors as wage rates, quality of living etc., then the following conclusion will be made. In general, despite considerable potential, the main subjective condition for demand forming for insurance products is the population trust to the financial markets itself, and to insurance in particular. Obviously, the homegrown insurance market should concentrate efforts to increase level of insurance literacy among the population and also to increase level of transparency among insurance companies.

**Table 2.** The Structure of Insurance Premiums and Insurance Benefits by classes of insurance (million tenge)

Classes of insurance	2014		2015		2016		2017		2018	
	Insurance Premiums	Insurance Benefits								
Obligatory insurance, million tenge	48 679	16 168	61 293	19 988	66 176	26 556	73 096	25 482	90 633	27 673
Voluntary personal insurance, million tenge	85 155	39 991	94 692	22 805	81 304	25 681	82 971	30 608	86 456	30 216
Voluntary property insurance, million tenge	77 678	11 890	123 251	9 172	118 641	10 065	132 204	11 124	179 814	25 060
Total	211 512	68 049	279236	31 977	266 121	62 302	288 271	67 214	356 903	82 949

Source: compiled by authors according to National Bank of the Republic of Kazakhstan, <http://www.nationalbank.kz>.

Table 3 presents a qualitative analysis of insurance sector in the Republic of Kazakhstan such as main figures of insurance sector of GDP billion tenge is made up to 239088,2 billion.

**Table 3.** The role of insurance sector in the Republic of Kazakhstan

Period	GDP, billion tenge	Insurance Premiums Ratio to GDP in %	Property Assets Ratio to GDP in %	Assets Ratio to GDP in %	Insurance Premiums Ratio to caput in tenge
2012	19 303,6	0,73	1,08	1,78	8 645,3
2013	27 571,9	0,64	0,84	1,41	10 537,4
2014	31 442,72	0,67	0,76	1,41	12 517,9
2015	34 291	1,53	0,74	0,81	16 272
2016	38 624,4	1,59	0,74	0,69	15 296,8
2017	40 884,1	2,02	0,99	0,70	16 331,4
2018	46 971,2	1,82	0,85	0,76	20 103,6

Source: compiled by authors according to National Bank of the Republic of Kazakhstan, <http://www.nationalbank.kz>.

In general, growth ratios of insurance market outrun equal the performance of all the economy of Kazakhstan. Such a successful development of insurance market is due to increasing wage rates and level of insurance culture among the population and professional mid-career education of participants in the insurance market. Thus, the insurance market of Kazakhstan is at a formation stage by international standards. By experts marks, the developed insurance markets, ‘life insurance’ in particular outrun Kazakhstan not less than a hundred years (Ivanov, 2008).

Due to fast entry of the republic into the World Trade Organisation (WTO) there is a need of studying consequences of integration for the homegrown insurance market into the developed architecture of the World Trade Insurance. It will be a basis for forming mechanism of harmonized interests for participants among Kazakhstan and World Trade Insurance Services.

#### 4. Data and methods

This research has been used data of all the presented insurance companies in the Republic of Kazakhstan for the last 6 years. Data of the companies have been taken from reports of National bank of the Republic of Kazakhstan and financial data reporting of the companies itself placed in depositary of financial data reporting. The financial data reporting more than 30 companies from 2012 for 2018 only 224 observations have been analysed. Data for the insurance market services have been taken from reports on the current position of National Bank of the Republic of Kazakhstan.

For the analysis of company profitability panel data analysis approach for assessment of the factors influencing on it have been used. Taken data for research are longitudinal data, so there are multiple observations for the same insurance company, also there is a time dimension and the phenomenon is observed at different points in time. Thus, data have two dimensions as company and time. Not all observations are independent from each other. In such cases it is practically to use panel data method. Mertens et al. (2017) as an example of successful using of this method is a research impact to firm investment and development for profitability (Mertens et al. 2017.). Model of panel data with the fixed effects, model of panel data with random effects have been used, then Hausman Test for choosing the most effective model has been carried out.

Assessment was made by using a package of Gretl econometric program. This software product is specialized means for the econometric analysis and modeling. Thus, nowadays it is one of the most modern means for carrying out of this sort researches differing in usability and efficiency. As it extends gratuitously it makes this software package attractive (Gusev, 2015).

This research was guided by work of Sharif et. al (2012), Akotey et al (2013) and Sumaira and Amjad (2013). The research has been devoted to identification of communications between work of insurance companies and their separate figures. Two studies has been performed on the basis of Pakistan insurance companies (Sharif et. al, 2012 and Sumaira and Amjad, 2013), one is on the basis of the Republic of Ghana (Akotey et al, 2013).

The concept of profitability can be understood widely, as McClenahan (1999) wrote profitability like beauty, in the eye of the beholder. Different stakeholders prefer different indicators. But for this research there is a need to choose one basic indicator that would most fully represent profit on the invested funds. In production companies, the indicator return on assets is often the most revealing and generalizing. Some researchers use it to analyze the profitability of insurance companies (Pervan, 2013).

Features of the insurance company are in the structure of its assets and obligations. Therefore, the indicator for insurance companies should show how much profit the insurance company could be generate from received insurance premiums. The Net Investment Income Ratio (Nissim, 2010) is indicator that particularly well suited for this purpose, so it reflects profitability of the insurance companies.

Financial data reporting of the companies and their dynamics, size and age have been chosen as independent variables. The first financial indicator was leverage. Leverage can be calculated as the ratio of debts to equity, as well as the ratio of debts to assets. Often researchers believe that leverage negatively affects profitability, that the more liabilities a company has, the less its profitability (Asimakopoulos, Samitas, and Papadogonas, 2009). However, Barua et.al (2018) in his study on insurance companies of emerging economies discovered that leverage impact is not clear in short term period, whereas in long term perspective its impact really was negative. Also were taken such financial indicator as current liquidity ratio. And based on the data from financial reports were calculated grow opportunities and earnings volatility following Sharif et. al (2012), Akotey et al, (2013) and Sumaira and Amjad (2013).

## **5. Results**

By presented panel data in the Table 4 it has been decided to form the regression model reflecting dependence of Profitability on the corresponding factors. The ordinary least squares and the generalized method of the least squares respectively have estimated parameters of panel data models with the fixed effects and panel data models with random effects.

The mix of explanatory variables on the basis of accounting control data are the following variables.

**Table 4.** Variables

Variable	Definition
Profitability	Ratio of net return before taxation to net premium
Leverage	Ratio of value of liabilities to the sum of insurance companies assets
Grow Opportunities	Ratio of sale uplift to the sum of insurance companies assets
Size	Base Premium Logarithm for insurance companies
Liquidity	Sum Assets Ratio to short-term liabilities
Age	Insurance Company Age is a shortfall of canvass and company forming year
Earning Volatitiy	It is profitability differential before taxation of previous year and year of observation divided into previous year i.e increment of growth is made

Source: compiled by authors

Researches include itself descriptive statistics, Pearson's correlation and results of panel models. The number of observation in panel data is 224 observations. 32 observations of insurance companies of the Republic of Kazakhstan from 2012 to 2018 are used in the Descriptive statistics (Table 5). Average value of the dependent variable is Profitability 0,3399. Standard deviation is 0,9863. The least value of profitability for organization is (-1,664), and the largest value of profitability for organization is 11,97.

**Table 5.** Descriptive statistics

Variable	Observation	Average	S.D.	Min	Max
Profitability	224	0,3399	0,9863	-1,664	11,97
Leverage	224	0,5000	0,2223	0,000	0,9381
Grow	224	0,6276	0,3968	0,000	2,073
Size	224	14,96	2,536	0,000	17,71
Liquidity	224	550,9	3501	-4985,0	43491
Age	224	12,08	6,551	0,000	25,00
Earning	224	0,1331	12,66	-127,5	82,51

Source: compiled and calculated by authors

**Table 6.** Complete Correlation Matrix

Correlation differentials, observation 1:1 - 32:7

5% criticality (double-sided) = 0,1311 for n = 224

Leverage	Grow	Size	Liquidity	Age	Earning	
1,0000	0,4200	0,5186	-0,0203	-0,1304	0,0537	Leverage
	1,0000	0,3740	-0,0352	-0,0381	-0,0401	Grow
		1,0000	0,0468	0,3668	0,0116	Size
			1,0000	0,0632	-0,0020	Liquidity
				1,0000	0,0625	Age
					1,0000	Earning

Source: compiled and calculated by authors

Table 6 depicts Pearson Index Correlation Matrix. Before starting model of panel data, it is necessary to check correlation between independent variables for the purpose of confirmation that there is no multicollinearity. As it

is seen from Table 6, there is no multicollinearity that confirms its result so as correlation is not up to 0.6 cut-off point.

Results of model of the fixed effects are given in Table 7. Considering values of parameters of model for this selection, it is possible to note importance of the Profitability variable from the Size variables which is the size of firm and has positive communication 0,0567399 and Age which is an age of firm and has positive communication 0,0401280, and other indexes have values close to 0 and have no significant effect on the resulting sign. An R-square in limits = 0,414391 between 0,043476.  $F(37, 186) = 2,31378$  r-value 0,000314921.

**Table 7.** Fixed effects (Dependent variable: Profitability)

Variables	Differential	St. error	t-statistics	P-significance
Const	-0,391882	0,717947	-0,5458	0,5858
Leverage	-0,741087	0,690195	-1,074	0,2843
Grow	-0,349491	0,259838	-1,345	0,1803
Size	0,0567399	0,0614137	0,9239	0,3567
Liquidity	-2,11610	1,74643	-1,212	0,2272
Age	0,0401280	0,0296764	1,352	0,1780
Earning	-0,00242347	0,00520985	-0,4652	0,6424

Average dependent variables	0,339886	Statistics deviation of dependent variables	0,986306
Sum of overall surplus squares	127,0387	Statistics model error	0,826440
LSDV R-squared	0,414391	In term of R-square	0,043476
LSDV F(37, 186)	3,557252	P-significance (F)	6,39e-09
Likelihood Logogriph	-254,3209	Akaike criterion	584,6419
Schwartz Criterion	714,2844	Hannah- Quinn criterion	636,9719
Rho parameter	-0,233621	Durbin-Watson statistic	2,317286

Source: compiled and calculated by authors

Joint test on named regressors -

Test statistics:  $F(6, 186) = 1,40901$

p-significance =  $P(F(6, 186) > 1,40901) = 0,213178$

Test for constant differences in groups -

Main hypothesis: groups have cumulative constants

Test statistics:  $F(31, 186) = 2,31378$

p-significance =  $P(F(31, 186) > 2,31378) = 0,000314921$

Essential parameters at significance value are designated (10% \*\*\*), (5% \*\*), (1% \*) in assessment of models. Labeling by asterisks facilitates fast estimation of the importance of parameters in the considered models. The result is considered statistically reliable (significant) if p-level doesn't exceed 0,05. Results of random effects model are given in table-8. The Leverage variables, size and grow are only significant at the level of 10%. Liquidity, age and earning aren't essential, all of them exert impact on the size of profitability. R-square in limits = 0,188563 between 0,166127.

**Table 8.** Random effects (Dependent variable: Profitability)

Variables	Differential	St.error	Z	P-significance
Const	-0,447132	0,418575	-1,068	0,2854
Leverage	-1,22818	0,404352	-3,037	0,0024 ***
Grow	-0,649100	0,188441	-3,445	0,0006 ***
Size	0,114502	0,0375616	3,048	0,0023 ***
Liquidity	2,25073	1,68978	0,1332	0,8940
Age	0,00781502	0,0127391	0,6135	0,5396
Earning	-0,00142384	0,00469645	-0,3032	0,7618

Average dependent variables	0,339886	Statistics deviation of dependent variables	0,986306
Sum of overall surplus squares	176,0286	Statistics model error	0,900662
R-square	0,188563	R-square corrected	0,166127
F(6,217)	8,404491	P-significance (F)	3,32e-08
Likelihood Logogriph	-290,8503	Akaike criterion	595,7005
Schwartz Criterion	619,5821	Hannah- Quinn criterion	605,3403
Rho parameter	0,127664	Durbin- Watson statistic	1,654883

Source: compiled and calculated by authors

Between group variance = 0,0670349

Within variance = 0,683004

theta, used for quasi-demeaning (demeaning) = 0,230093

corr (y,yhat)<sup>2</sup> = 0,186078

Joint test on named regressors -

Asymptotic test statistics: Chi-square (6) = 34,3525

p-significance = 5,75101e-006

Breusch-Pagan Test-

Main hypothesis: Special variance for error observing =0

Asymptotic test statistics: Chi-square (1) = 10,1633

p-significance= 0,00143261

Hausman Test -

Main hypothesis: OLSM is justifiable

Asymptotic test statistics: Chi-square (6) = 21,1331

p-significance = 0,00173628

It is very difficult for above described model to choose what model approaches. Hausman's test will be started to cope with this problem for solving suitable model from two possible options. In addition, the model with random effects was statistically significant. See Table 8, Table 9, Table 10 and Table 11.

**Table 9.** Hausman Test

Variables	Fixed	Random	Differential
Leverage	-0,741087	-1,22818	-0,4871
Grow	-0,349491	-0,649100	-0,2996
Size	0,0567399	0,114502	0,0578
Liquidity	2,11610	2,25073	0,1346
Age	0,0401280	0,00781502	-0,0323
Earning	-0,00242347	-0,00142384	0,0010

Diagnostics: using n = 32 cross-sectional units

Source: compiled and calculated by authors

**Table 10.** Fixed effects estimator allows for differing intercepts by cross-sectional unit

Variables	Index	St.error	t-statistics	P-significance
const	-0,391882	0,717947	-0,5458	0,5858
Leverage	-0,741087	0,690195	-1,074	0,2843
Grow	-0,349491	0,259838	-1,345	0,1803
Size	0,0567399	0,0614137	0,9239	0,3567
Liquidity	-2,11610e-05	1,74643e-05	-1,212	0,2272
Age	0,0401280	0,0296764	1,352	0,1780
Earning	-0,00242347	0,00520985	-0,4652	0,6424

Source: compiled and calculated by authors

Residual variance:  $127,039 / (224 - 38) = 0,683004$

Cumulative significance for differential in average groups

$F(31, 186) = 2,31378$  p-significance 0,000314921

(Low p-significances indicate to a weak main hypothesis of adequacy the integrated panel data model preferring to model with the fixed effects.)

Variance estimators:

between = 0,0670349

within = 0,683004

theta used for quasi-demeaning = 0,230093

**Table 11.** Random effects estimator allows for a unit-specific component to the error term

Variables	Index	St. error	t-statistics	P-significance
Const	-0,447132	0,418575	-1,068	0,2866
Leverage	-1,22818	0,404352	-3,037	0,0027 ***
Grow	-0,649100	0,188441	-3,445	0,0007 ***
Size	0,114502	0,0375616	3,048	0,0026 ***
Liquidity	2,25073e-06	1,68978e-05	0,1332	0,8942
Age	0,00781502	0,0127391	0,6135	0,5402
Earning	-0,00142384	0,00469645	-0,3032	0,7620

Source: compiled and calculated by authors

Breusch-Pagan test statistic:

$LM = 10,1633$  with p-value =  $\text{prob}(\text{chi-square}(1) > 10,1633) = 0,00143261$

(Low p-significances indicate to a weak main hypothesis of adequacy the integrated panel data model preferring to model with random effects.)

Hausman test statistic:

$H = 21,1331$  with  $p\text{-value} = \text{prob}(\text{chi-square}(6) > 21,1331) = 0,00173628$

(Low  $p$ -significances indicate to a weak main hypothesis of adequacy the integrated panel data model preferring to model with the fixed effects.)

## Conclusions

As a result of empirical testing the hypothesis for positive communication for level of a financial leverage, the size of firm and a hypothesis for inverse relation for profitability, a possibility for growth of the fixed production assets and the equipment, not debt tax board with profitability level are confirmed. It is found out that the greatest impact on profitability of insurance company is exerted by financial leverage. The received results for communications of the size of firm, possibilities for growth of the fixed production assets and the equipment correspond to provisions for the compromise theory. While the results for renability and financial leverage correspond to the theory of order the debt to assets figure shows as far as the company can fulfill its current obligations. Respectively the adequacy of reflection for obligations in financial data reporting influences on assessment of profitability for insurance company by external users. As how correctly estimated depends company's look itself for financial data reporting users, and consequently what decisions will be made by investors, creditors and other stakeholders.

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