

Factors Influencing the Broker-Dealers Equity Level

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One of the regulator's responses to the crises was the limitation of dividends pay-off for the regulated market. The aim of the paper is to investigate the factors influencing the equity level in New Basel Accord environment. An ordinary and panel analysis were applied for a sample of Polish based broker-dealers entities. The evidence was collected from 110 annual financial statements for the period 2000-2010. Irrespectively of the methodology used the implementation of Basel II made the increase of broker-dealers net equity. There was no significant impact observed to the equity in respect of dividends pay-offs, type of audit opinion or cash flow level. The paper provides evidence that the imposing dividend pay-out restriction by policymakers is not an effective tool compared to the stimulation of the overall market profitability.

JEL Codes: G24, G32 and M42 Finance/Accounting

1. Introduction

The main issue behind this paper is: should we care about implementation of capital requirement to broker-dealers market? This question actually captures the potential wrong-doings of the supervision and behaviour of the market players, and at the same time it refers to the dynamic capital conservation stream.

The Polish Financial Supervisory Authority issued a recommendation for the supervised entities to enhance the capital base as of November 2012. The recommendation tightened and limited the owner's ability to dividends' pay-offs. The potential payment of dividend was linked to the capital converge and results of SREP (Supervisory Review and Examination Process) (Komisja Nadzoru Finansowego 2012). The paper argues that the selection of the supervision tool was adequate for the existing situation at the broker-dealers market. The proposition of Brogi, for tightening the dividend policy, is challenged on broker-dealers market (Brogi 2010, p.244).

The objective is to analyze factors influencing the equity level and to verify the effectiveness of the distributions restrictions as the capital conservation tool for market regulatory authority.

The paper is structured as follows: section two provides the literature review on the discussion about broker-dealers market. The third section deals with the methodology. The fourth provides the description of the data and sampling. The fifth section provides the results. The sixth section summarizes the conclusions.

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2. Theoretical Aspects

The international discussion of the broker-dealers markets is reflected in a number of areas. Battalio reviewed the negative selection for pooled brokers-dealers orders (1997), the same was subject to research some ten years later (2008). Conrad and others examined the transaction costs between institutions and alternative trading platforms (Conrad et al. 2003). The post-crisis issuer's strategy and the client abuse rules were identified by Isakoff (2012). The Polish discussion on the broker-dealers covers isolated aspects like: Kołosowska and other examining a niche monopoly for Dom Maklerski BPS SA referring to the issue of cooperatives bounds (2012). Waliszewski pointing out that the financial advisory profession is not entirely regulated (Waliszewski 2010). Staszkievicz was exploring the consequences of the implementation of Basel Accords over broker-dealers markets, disclosure requirements, reputational risk and consequences for risk reporting (2013; 2012; 2011). Issues regarding shadow banking for non licensed broker-dealers entities were taken into account by Masiukiewicz in his classification of shadow entities (2012, p.13).

The impact study of introduction of The New Capital Requirement was shown on the banking sector by numerous authors (Herring 2002; Garside and Bech 2003). The expectation was that the implementation of the capital requirement will enhance the capital, increase the cost of equity, lower the competition advantage in a short-run and increase the social stability. Gordy and Howells pointed out the procyclicality in Basel II (2006).

The dividend policy topic has an extensive literature. Miller and Modigliani (1961) shown the irrelevance of financing. La Porta *et al.* (2000) provided explanation for the dividend policy based on the agent theory, while DeAngelo and DeAngelo (2006) explained a link to the distributable cash flow. Fama and French (2001) offered number of key variables like, size, growth, profitability to explain the dividends stream. Al-Najjar and Hussarney offered an enhanced list to: firm size, firm risk, firm growth rate, firm profitability, asset tangibility; the corporate governance characteristics - board size and outside directorships - being the main drivers of capital structure of UK firms (Al-Najjar and Hussainey 2011, p.336).

Brogi merged impact of the capital adequacy and dividend policy of Italian banks advising "greater austerity in dividends distribution" (Brogi 2010, p.244) due to large incomes of the banks being distributed via dividends.

The assessment of effectiveness of specific restrictions on short selling was performed by Linnertova. She tested negatively:

- 1) the idea that during short sell restrictions the stock prices tend to be over-valuated because not all negative information are reflected in the stock price. and
- 2) after lifting the short sell restriction, prices will tend to its fundamental value because short sell is used by informed investors mainly (Linnertova 2013, p.156).

There were no attempts, to the author's knowledge, to assess the impact of the Basel requirements on the broker-dealers equity position in Poland. The literature on the effectiveness of specific supervision tools is not substantial. This paper aims to remove this gap.

3. Methodology

For the purpose of the verification of the hypothesis an accounting approach was chosen. The proxy for the supervised capital is equity. On broker-dealers market the impact of tier two and tier three capital is insignificant.

The selection of the independent variables streams directly from the accounting techniques and corporate finance methodology. As the research is conducted over the intermediary and fiduciary entities the majority of assets-balance position is covered by the cash and cash equivalent positions. The earning ability is linked to the off-balance sheet positions (assets under management and clients assets on accounts), the liquidity risk has been captured by the total cash flow position. Due to fraud and misstatement risk the audit opinion variable was selected to safeguard the quality of data in the model. Basic capital was included in order to highlight the core capital concept developed in the time of valid Basel Accord. Because of the step-wise implementation of Basel Accord to the Polish environment (phase I Polish access to European Union period 2005-2008, phase II 2009-2010 implementation of the CRD) the two dummy variables were introduced to the model. The horizon observation from 2001 to 2010 was select to capture both implementation periods and pre implementation period.

The tool used for the research is the regression analysis. Due to the nature of the problem as well the relatively small number of entities with sufficient long life time-span, the application of the pool regression might not allow for the slight changes in the market. Therefore the classical regression was selected as verification tool for the panel analysis. Both fixed and random effect model were considered. There is reasonable expectation for the random effect model that may not hold true. It is because the composite error term $err_{i,t}$ consist of two elements: unit specific error ε_i and idiosyncratic term - $u_{i,t}$ thus

$$err_{i,t} = \varepsilon_i + u_{i,t} \quad (1)$$

on the other hand the last square regression implies the restriction over the $err_{i,t}$ in order to obtain the BLUE estimator so as the ε_i and $u_{i,t}$ follows the $N(0, \sigma_\varepsilon^2)$ and $N(0, \sigma_u^2)$ distribution respectively. Another assumption is imposed:

$$E(\varepsilon_i u_{i,t}) = 0; \quad E(\varepsilon_i \varepsilon_j) = 0 \text{ for } i \neq j, \quad (2)$$

and

$$E(u_{i,t} u_{j,k}) = 0 \text{ for } i \neq j, t \neq k \text{ and } i=j; t=k \quad (3)$$

Thus the variance of $err_{i,t}$ is the sum of variances of the specific and idiosyncratic term:

$$\text{Var}(err_{i,t}) = \sigma_\varepsilon^2 + \sigma_u^2 \quad (4)$$

In case the σ_ε^2 becomes 0 the model reduces to OLS. This actually gives the right for the verification approach. The character of the $err_{i,t}$ variance implies (4) homoscedasticity but according to Gujarati (Gujarati and Porter 2009, p.603) the errors $err_{i,t}, err_{i,k}$ for $t \neq k$ are correlated in the following way:

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$$\text{Corr}(\text{err}_{i,t}, \text{err}_{i,k}) = \frac{\sigma_{\varepsilon}^2}{\sigma_{\varepsilon}^2 + \sigma_u^2}, \text{ for } t \neq k \quad (5)$$

This characteristic is confirmed by a time irrelevant stable value of correlation between different time span of a specific unit and contrary to the AR(1), it is universally stable over any given time span within the unit. This characteristic might cause a misinterpretation of the model if any of the variables had the cumulative character over time (e.g. retained profit). As the companies tend to have a strong individual characteristic, the specific components of $\text{err}_{i,t}$ tends to be correlated with other variables and thus the ECM (Error Component Model) becomes irrelevant for the analysis purposes.

For verification purposes the Hausman test is used. The test has a null hypothesis that the FEM (Fixed Effect Model) and ECM (Error Components Model) do not differ significantly. The test statistic is an asymptotic χ^2 . If the test is rejected this may be due to the correlation of random effects with repressors, therefore the FEM would be more appropriate.

Another statistics used is Breuch and Pagan Lagrange Multiplier Test (BP-test). It has a null hypothesis that there are no random effects $\sigma_u^2 = 0$ with χ^2 and 1 df. Inability to reject the null hypothesis indicates that the FEM is more relevant. Nevertheless, the assumption behind the ECM model is that there is a random sample of units from a larger population. Since there is a total population of the Polish Broker-Dealers of ca 50 units, the fundamentals of ECM are fragile at this caseⁱⁱ. Some authors (Śledziwska and Witkowski 2012, p.434) indicated that a requirement of co-linearity between the error term and all the variables in case of the ECM is not relevant.

Taking into account the above discussion, the aim of the paper is restated to the following set of hypothesis:

Null hypothesis is H_0 : The implementation of the capital requirement directive did not influence significantly the overall equity level of the broker-dealers versus

Alternative hypothesis H_1 : The implementation of the capital requirement directive influenced significantly the overall equity level of the broker-dealers.

Analytical formula of the model is as follows:

$$\text{Equity}_{i,t} = \alpha \mathbf{x} + u_{i,t}$$

While α is a vector of parameter, \mathbf{x} represents the independent variables, and $u_{i,t}$ represents the stochastic error term (depending on the estimation method).

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The definition of equity and independent variables are stated in the table below:

Table 1: Variables definition

No	Variable	Definition	Type
1	CRD_1	I phase of implementation of CRD, values 1 for 2006-8.	Dummy
2	CRD_2	II phase of implementation of CRD, values 1 for 2009 and 2010	Dummy
3	Cash	cash and cash equivalents as reported in balance sheet positions	Integer
4	ShareCap	share capital or basic capital as reported in balance sheet positions	Integer
5	Equity	total equity (including capital reserves)	Integer
6	OffBalance	total off balance sheet position as at the reporting year end day	Integer
7	Result	net profit	Integer
8	CashFlow	total net cash flow for the reporting period	Integer
9	Opinion	audit opinion	Integer
10	Divid	value of dividend allocated for the reporting period	Integer

Source: own data

4. Population and Data Sampling

The Polish broker-dealers market consists of entities domiciled in Poland and entities accredited on the Polish territory. Among the domiciled in Poland entities there are the broker dealers' houses being separate legal entities and brokers dealers offices of banks operating in the Polish environment.

According to the Polish Financial Supervisory Authority there is 2 273 680 thousands zł of assets on the market, total capital requirement amounts to 861 173 thousands zł, while the aggregated level of the internal capital amounts to 966 623 thousands zł. However the off-balance sheet position - especially client assets - of 134 297 306 thousands zł and assets under management of 73 159 921 thousands zł makes this segment important to the economyⁱⁱⁱ (KNF 2012).

The entities accredited for the Polish territory are subject to the supervision of their relevant home regulatory. As of the research cut-off date (November 2012) in Poland operated 15 bank offices, which did not present separated financial statements. Because of it the banking offices were excluded from the tested population. There were 50 entities domiciled and supervised locally as at the end of 2010. In order to investigate the average response of the market to the change of the capital requirements, a restriction has been imposed that the observed entities must hold the broker-dealer licence though the entire examination period. After allowing for this restriction the sample has been selected at random. The sample contains 10 units, randomly selected, making 20% of population coverage.

The source data constitute the selected variables gathered from the unconsolidated financial statements published in "Monitor Polski B" (local legal register journal). The data with qualified audit opinion have been removed from the observation. There were no restatements performed for the items with different reporting dates, other than 31 December. Due to the manual gathering of the data the quality review of the input was preformed and discovered mistypings were corrected. The final data set after testing

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consists of less than 5% wrong input data. No adjustments were done for differences between the Polish accounting standards and International Financial Reporting Standards as the valuation differences from the accounting perspective were considered as minor with reference to the variables definitions.

The time span for data was set as the period 2000-2010, as there were no significant changes in the investigated environment in those years compared to 1991-2000 – the hyperinflation period, changes in accounting rules (introduction of fair value accounting and financial instruments reporting, changes of consolidation requirements). To avoid the misspecification of data and inclusion of peripheral effects for dissolved and liquidated companies, a restriction was imposed on the population, that the companies included in testing must be active and have licensing throughout the period of the examination. After allowing for the above mentioned restriction the selection of the sample was random.

5. Results and Discussion

The calculations were performed with the application of Statistica and Gretl software. The estimation of the fixed effect model was performed using the fixed effect within group (WG) estimator the actual data has been de-meanned. The linear correlation values are presented in table two for all the variables.

Table 2: Correlation matrix of the tested variables

	1	2	3	4	5	6	7	8	9	10
1 CRD_1	1,00									
2 CRD_2	-0,31	1,00								
3 Cash	0,07	0,30	1,00							
4 ShareCap	-0,02	0,08	0,43	1,00						
5 Equity	0,28	0,18	0,63	0,48	1,00					
6 OffBalace	0,11	0,01	0,17	0,57	0,23	1,00				
7 Result	0,36	-0,01	0,33	0,05	0,83	-0,08	1,00			
8 CashFlow	-0,05	0,02	0,42	0,04	0,28	-0,03	0,29	1,00		
9 Opinion	-0,08	-0,15	-0,15	-0,09	-0,18	-0,07	-0,13	-0,06	1,00	
10 Divid	0,31	0,02	0,49	0,15	0,84	-0,02	0,91	0,31	-0,11	1,00

Bold: correlations are significant at $p < .05$; $N=110$ cases

Source: own calculations

It should be noted that except for the negative correlation between implementation phases of the capital requirement directives there is no other significant negative correlation, which would yield asymptotical co-linearity of the model.

In tables 4 to 6 there are presented parameters of pooled OLS, fixed and variable effects together with adequate test. The models were calculated on the balanced observation for 11 broker-dealers company houses for the period between 2001 and 2010.

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Table 3: Model 1: Pooled OLS, using 110 observations. Included 11 cross-sectional units. Time-series length = 10. Dependent variable: Equity.

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
const	3.6e+06	2.5e+06	1.47	0.14460	
CRD_1	1.4e+06	2.8e+06	0.52	0.60187	
CRD_2	1.1e+07	3.0e+06	3.64	0.00042	***
Cash	0.071	0.012	5.96	<0.00001	***
ShareCap	0.696	0.070	9.92	<0.00001	***
OffBalnace	0.003	0.001	2.69	0.00835	***
Result	0.905	0.075	12.00	<0.00001	***
CashFlow	-0.037	0.021	-1.71	0.08946	*
Opinion	-317826	1.1e+06	-0.29	0.76701	
Divid	0.088	0.070	1.25	0.21356	

*, **, *** represents significance at $p < .1$; $p < .05$; $p < .01$ respectively.

Mean dependent var	42530413	S.D. dependent var	46822741
Sum squared resid	1.22e+16	S.E. of regression	11039983
R-squared	0.948997	Adjusted R-squared	0.944407
F(9, 100)	206.7405	P-value(F)	1.78e-60
Log-likelihood	-1934.715	Akaike criterion	3889.430
Schwarz criterion	3916.435	Hannan-Quinn	3900.383
rho	0.639204	Durbin-Watson	0.696420

Source: own calculations.

Table 4: Model 2: Fixed-effects, using 110 observations. Included 11 cross-sectional units. Time-series length = 10. Dependent variable: Equity.

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
const	-1.8e+07	5.6e+06	-3.23	0.00169	***
CRD_1	4.3e+06	2.0e+06	2.10	0.03785	**
CRD_2	1.1e+07	2.2e+06	5.16	<0.00001	***
Cash	0.021	0.014	1.54	0.12650	
ShareCap	2.059	0.324	6.36	<0.00001	***
OffBalnace	0.0006	0.001	0.65	0.51607	
Result	0.950	0.059	15.8	<0.00001	***
CashFlow	-0.0148	0.0156749	-0.94	0.34889	
Opinion	-362301	824900	-0.43	0.66156	
Divid	0.057	0.052	1.09	0.27664	

Mean dependent var	42530413	S.D. dependent var	46822741
Sum squared resid	5.24e+15	S.E. of regression	7631312
R-squared	0.978067	Adjusted R-squared	0.973437
F(19, 90)	211.2305	P-value(F)	4.08e-66
Log-likelihood	-1888.301	Akaike criterion	3816.602
Schwarz criterion	3870.612	Hannan-Quinn	3838.509
rho	0.092635	Durbin-Watson	1.603937

*, **, *** represents significance at $p < .1$; $p < .05$; $p < .01$ respectively.

Test for differing group intercepts - Null hypothesis: The groups have a common intercept. Test statistic: $F(10, 90) = 11.9285$ with $p\text{-value} = P(F(10, 90) > 11.9285) = 7.69278e-013$

Source: own calculations.

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The F test statistic for differing group intercepts amount to ca 12 with a significant low value, which indicates that OLS model is not relevant. In addition, the Durbin Watson statistics of 0.7 reinforces this remark even if adjusted R-squared amounts to 0.94. In contrast to the pooled model, the fixed effect model with the Durbin Watson statistics of 1.6 and adjusted R-squared of 0.97 seems to be relevant. The BP-test of 75 and low p-value indicates rather to random effect model, while Hausman test of $H = 144$ with small p-values rejects the ECM. The ECM presents the significant variance “within” which is different from “between” by a decimal rate. It indicates rather the group’s specific effect importance. Taking into account the above discussed characteristic of the population, the fixed effect model should be rather taken for the processes identification.

Table 5: Model 3: Random-effects, using 110 observations. Included 11 cross-sectional units. Time-series length = 10. Dependent variable: Equity.

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
const	3.6e+06	2.5e+06	1.47	0.14460	
CRD_1	1.4e+06	2.8e+06	0.52	0.60187	
CRD_2	1.1e+07	3.0e+06	3.65	0.00042	***
Cash	0.072	0.012	5.96	<0.00001	***
ShareCap	0.696	0.070	9.93	<0.00001	***
OffBalance	0.003	0.001	2.69	0.00835	***
Result	0.906	0.075	12.00	<0.00001	***
CashFlow	-0.037	0.021	-1.71	0.08946	*
Opinion	-317826	1.1e+06	-0.30	0.76701	
Divid	0.088	0.070	1.25	0.21356	

*, **, *** represents significance at $p < .1$; $p < .05$; $p < .01$ respectively.

Mean dependent var	42530413	S.D. dependent var	46822741
Sum squared resid	1.22e+16	S.E. of regression	10985193
Log-likelihood	-1934.715	Akaike criterion	3889.430
Schwarz criterion	3916.435	Hannan-Quinn	3900.383

'Within' variance = 5.8e+013

'Between' variance = 1.7e+012

theta used for quasi-demeaning = 0

Breusch-Pagan test - Null hypothesis: Variance of the unit-specific error = 0

Asymptotic test statistic: Chi-square(1) = 75.1731 with p-value = 4.31197e-018.

Hausman test - Null hypothesis: GLS estimates are consistent. Asymptotic test statistic: Chi-square (9) = 144.091 with p-value = 1.47369e-026

Source: own calculations.

The below stated tables summarises the significance of the model parameters depending on the modelling approach.

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Table 6: Summary significance of parameters by method

	<i>Pooled</i>	<i>Fixed effect</i>	<i>Random effect</i>
const		***	
CRD_1		**	
CRD_2	***	***	***
Cash	***		***
ShareCap	***	***	***
OffBalance	***		***
Result	***	***	***
CashFlow	*		*
Opinion			
Divid			

* , ** , *** represents significance at $p < .1$; $p < .05$; $p < .01$ respectively.
Source: own presentation.

The net cash flow position seems to be irrelevant even if ordinary pooled regression and random effects disclose some significance.

Irrespectively of the methodology accepted, the CRD_2 variable, this is implementation of the Basel II Accord to the market, has a significant impact over the broker-dealers capital (as stated in table 7). This supports initial Herring prediction. The mixed results have been observed for cash and cash equivalents and off-balance sheets items, which indicate an entity specific effect. Irrespectively of the methodology neither audit opinion nor the dividends pay-off do not significantly influence the maintenance of the equity.

The results support the observation that tightening the capital requirement caused by implementation of Basel II is populated toward the satellite markets as broker-dealers in Poland.

Strong significance of the share capital is expected. The entry requirements for the broker-dealers market prior to licensing are based on the initial share base. In addition to the entry requirements, the share capital is a base for further requirements regarding tier two and three capital. Contrary to OLS and random model the cash position, as per the fixed effect is not significant.

Lack of significance of the off-balance sheet position might be explained in conjunction with the result significance. As the off-balance sheet position does not directly impact the balance sheet risk, the risk is transferred via the fixed holding charge on the assets under custody. The simpler the holding charge structure is the stronger relation to the results. As a result, changes of the off-balance sheet position are to a large extent explained by changes subject to simple off-balance sheet charges structure. As Polish market is relatively less developed, the charges are usually close to a linear transformation of the off-balance sheet position.

The insignificance of the dividend's level stays in contrary with Brogi recommendation. In addition a significant correlation observed between results and dividends level indicates an expected significant effect to the equity. The parameters estimations for all of the models do not support the above. These intuitively contradictory effects

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may be explained with overcapitalization of market in respect of the standards risk measures. Another explanation offers the way of the capital budgeting. The transfer of the added value of the entity to stakeholders may be done by application of the taxed dividends cash flow but as well by the transfer pricing, related party transaction or financial loan which is outside the scope of thin capitalization rules. This indicates the relative weaknesses of the dividends' restriction policy and supports Gordy and Howells observation that dividends can be raised and lowered with the anticipated capital needs (Gordy & Howells 2006, p.399). Dividend management offers rather a buffering function. It seems that the application of dividend restrictions may have only a short time effect. Incentives to results (rather profitability) might outweigh the restrictions over dividends and are likely to have a longer-term effect.

6. Conclusion

The objective was to analyze potential factors influencing the equity level and to verify the effectiveness of the dividends restrictions as the capital conservation tool for market authority.

The significant factors, which impact the broker-dealers equity level turned to be basic share capital, off-balance sheet position and the point of tightening the capital requirements.

The dividend policy turned to be irrelevant for the capital maintenance thus it highlights new dimension for the supervising policy selection rules.

The initially indicated hypothesis was rejected in all of the models, the CRD implementation relived to the significant factor for the capital level on broker – dealers market. The initial capital restriction in phase I tends rather to be relevant while considering the fixed effect model. The research does not support the tightening the dividends policy as the long-run solution to the capital base.

When generalizing, the conclusion should be taken into account that the research was performed on relative homogenous market in Poland. Even if the tested sample represents 20% of the whole population of broker-dealers domiciled in Poland, the number of entities is still small compared to the entire European or world market. Relatively high values of the Akaike and Schwarz criteria's indicate the co-linearity effect.

The findings support the Herrings, Garside and Bech expectation for the short term capital improvements after implementation of Basel II. The conclusion of this research confers the observation of K. Sum regarding the banking sector "The set of exercises points to the significant positive influence of restrictive banking regulation on the relation between financial integration and growth" (Sum 2012, p.57) as well to the broker-dealers market in Poland. The dividends restriction is not necessary the most effective capital conservation tool especially when comparing to the stimulation of profitability.

Endnotes

ⁱ Where i indicated the unit, and t – time period.

ⁱⁱ For panel data with significant values of units and fewer time observation the ECM tends to be more appropriate, while in opposite situations the FEM.

ⁱⁱⁱ Data as of 1st quarter of 2012. The share of the total assets under custody and management represents approximately 50% of the Polish annual state budget value.

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