DYNAMIC ECONOMETRIC MODELS
DOI: http://dx.doi.org/10.12775/DEM.2017.009 Vol. 17 (2017) 147−159

Submitted November 28, 2017
Accepted December 28, 2017

ISSN (online) 2450-7067
ISSN (print) 1234-3862

Dorota Witkowska, Krzysztof Kompa *

How the Change of Governing Party Influences the Efficiency of Financial Market in Poland

A b s t r a c t. Financial market seems to be sensitive to political changes, especially when the change of governing party is connected with essential changes of the economic development concepts. Such situation took place in Poland in 2015, as a result of the presidential and parliamentary elections. The aim of our research is to investigate the changes occurred on the market, represented by some stable growth open mutual funds, and stock indexes: WIG and TBSP. Analysis is provided applying single index and CAPM models, classical investment performance measures, and statistical interference.

K e y w o r d s: stable growth open mutual funds, investment efficiency, Sharpe model, CAPM, Sharpe, Treynor and Jensen ratios.

J E L Classification: G11; C12.

Introduction

Financial market seems to be sensitive to political changes, especially when the change of governing party is connected with essential changes of the concepts concerning economic development. Such situation took place in Poland at the end of 2015, as a result of the presidential and parliamentary elections that were won by the Law and Justice party (PiS) which was in an opposition to the government during two last terms. Now PiS is the largest

* Correspondence to: Krzysztof Kompa, Warsaw University of Life Sciences, Department of Econometrics and Statistics, 166 Nowoursynowska Street, 02-787 Warsaw, Poland, e-mail: krzysztof_kompa@sggw.pl; Dorota Witkowska, University of Lodz, Faculty of Management, Department of Finance and Strategic Management, 22/26 Matejki Street, 90-237 Łódź, Poland, e-mail: dorota.witkowska@uni.lodz.pl.

http://www.dem.umk.pl/dem

party in the Polish parliament having majority in both chambers of parliament. The governing party introduced program called "good change" consisting in populist movements such as decreasing of the retirement age or the 500+ Familly Programme, etc. which burden the economy and may affect the financial market.

Therefore, here a question arises how the change of ruling party and their economic program influence the situation of Polish financial market. The answer is not easy especially that both sides i.e. governing and opposite parties presented completely different arguments which had rather political than economic character. PiS was emphasizing social benefits of proposed programs while the opposition was highlighting the economic consequences and threats for the budget. Some economists even forecasted that financial market in Poland may collapse since investors do not trust markets with high political risk which comes from social programs together with controversial economic proposals such as increasing taxes from the banking sector or supermarkets.

Therefore, the aim of our research is to find out how the change on the political scene affected the performance of equity and bond markets, together with stable growth mutual funds (FIO), applying single index and capital assets pricing models together with classical investment performance measures and statistical interference.

1. Data and Methodology

Our investigation is carried out using daily logarithmic rates of returns from selected financial instruments:

- Warsaw Stock Exchange Index – WIG, representing equity market,
- Poland's Official Treasury Bonds Index – TBSP.Index, representing bond market,
- participation units of stable growth open mutual funds (FIO): Credit Agricole Stabilnego Wzrostu (denoted as CA), KBC Fundusz Stabilny (as KBC), Nationale-Nederlanden Stabilnego Wzrostu (as NN), Pioneer Stabilnego Wzrostu (as PIO) and PZU Stabilnego Wzrostu MAZUREK (as PZU).

The analysis is provided for the period from 10.10.2013 to 9.12.2016 (the whole period including 826 observations). This time span is divided into five pairs of sub-periods according to the selected events which we take into consideration:

- the presidential elections: the first round of election – 10.05.2015, the second round of election – 24.05.2015,

– the parliamentary election – 25.10.2015,
– the new government appointment – 16.11.2015,
– the entry into force 500+ Familly Program – 1.04.2016.

The subperiods are defined assuming that the last observation comes from 9.12.2017, and sharing date is a day when the distinguished event took place. It was our concern to obtain subsamples with similar number of observations (detailed information about sample sizes are in Table 2).

Investigation of returns and risk generated by the investment portfolios constructed by selected funds is conducted in several steps, beginning from the analysis of the basic parameters and applying statistical interference[1] (assuming the significance level 0.05). Denoting by: $E(R)$ – expected returns, $D^2(R)$ – variance of returns, R_{WIG}, R_{TBSP}, R_{FIO} – returns from WIG, TBSP and FIO respectively, β, α – parameters of Sharpe model or CAPM, R_{before}, R_{after}, β_{before}, β_{after} – returns from the portfolio and beta coefficients before and after the considered event, respectively, we verify the null hypotheses concerning:

1. rates of return levels, i.e.: $E(R_{FIO}) = 0$; $E(R_{WIG}) = 0$; $E(R_{TBSP}) = 0$,
2. parameters of Sharpe and CAPM models, i.e.: $\beta = 0$; $\alpha = 0$,
3. comparisons of parameters values in two considered sub-periods i.e.: $E(R_{before}) = E(R_{after})$, $D^2(R_{before}) = D^2(R_{after})$, $\alpha_{before} = \alpha_{after}$, $\beta_{before} = \beta_{after}$.

We apply the classical tests for verification hypothesis of returns equity:

– using the Cochran-Cox test statistics:

$$u = \frac{R_1 - R_2}{\sqrt{\frac{S_1^2}{T_1} + \frac{S_2^2}{T_2}}} \tag{1}$$

– and using the following statistics:

$$u_k = \frac{R_k - B}{S_k}\sqrt{T_k} \tag{2}$$

where for the k-th period, R_k – average logarithmic rate of return from the selected instrument, S_k^2 – variance of return, T_k – number of observations, B – benchmark: $B=0$, $B=R_1$ or $B=R_2$. The comparison of returns in both period is provided using statistics (1) and (2). In the letter case benchmark B is defined as an average value of returns obtained in the second considered period (k=1, 2) and the test is provided as two-way test.

Comparison of variances is provided using the test with Fisher statistics:

$$F = \frac{S_{max}^2}{S_{min}^2} \tag{3}$$

[1] All formulas (1)-(5) are discussed in (Witkowska 2016, p. 29-55).

where, S^2_{max}, S^2_{min} – maximal and minimal variance obtained for the both compared samples.

The shape of the probability distribution of logarithmic rates of return is examined on the basis of parametric tests verifying hypothesis that symmetry and kurtosis equal to zero, applying the following statistics:

$$u_k = A_t \cdot \left(\frac{6}{T_t}\right)^{-\frac{1}{2}} \tag{4}$$

$$u_k = K_t \cdot \left(\frac{24}{T_t}\right)^{-\frac{1}{2}} \tag{5}$$

where, A_t, K_t – the third and the fourth central statistical moments of logarithmic rates of returns.

The next step of our research is estimation of Sharpe and capital assets pricing models on the basis of daily logarithmic rates of return[2]:

$$R_{it} = \alpha_i + \beta_i R_{rt} + \varepsilon_{it} \tag{6}$$

$$R_{it} - R_{ft} = \alpha_i + \beta_i (R_{rt} - R_{ft}) + \varepsilon_{it} \tag{7}$$

where for the *t*-th period, R_{it} – rate of return from participation units of the *i*-th stable growth open mutual fund; R_{rt} – rate of return from the market index (WIG); R_{rt} – rate of return from the risk-free instrument (TBSP); α_i, β_i – model parameters, ε_{it} – random component; t – number of observation ($t=1, 2, \ldots, T$). Parameters of both models are estimated using OLS method.

Analysis of parameter significance in the models is provided using the test statistics[3]:

$$t = \frac{\hat{\alpha}_i}{S(\hat{\alpha}_i)} \text{ and } t = \frac{\hat{\beta}_i}{S(\hat{\beta}_i)} \tag{8}$$

where, $\hat{\alpha}_i, \hat{\beta}_i$ – parameter estimates, $S(\hat{\alpha}_i), S(\hat{\beta}_i)$ – standard estimation errors from the models (6) and (7).

Comparison of parameters obtained in both comparable periods is made applying the test statistics:

$$t_1 = \frac{\hat{\alpha}_{1i} - \hat{\alpha}_{2i}}{S(\hat{\alpha}_{1i})} \text{ and } t_2 = \frac{\hat{\alpha}_{1i} - \hat{\alpha}_{2i}}{S(\hat{\alpha}_{2i})} \tag{9a}$$

$$t_1 = \frac{\hat{\beta}_{1i} - \hat{\beta}_{2i}}{S(\hat{\beta}_{1i})} \text{ and } t_2 = \frac{\hat{\beta}_{1i} - \hat{\beta}_{2i}}{S(\hat{\beta}_{2i})} \tag{9b}$$

[2] Models are widely discussed in literature see for instance: (Zamojska 2012, p. 57-60), (Witkowska 2016, p. 41-48)

[3] These measures are discussed in (Witkowska 2016, p. 49-50).

The performance of mutual funds is provided using classical measures i.e. Sharpe, Treynor and Jensen ratios[4]. The first two measures estimate the obtained risk premium evaluated for the unit of risk and the decision about the efficiency is made by comparing the values of the ratios obtained by the mutual fund and the market index. Jensen ratio is the parameter estimate $\hat{\alpha}_i$ from CAPM, and investment is efficient if $\hat{\alpha}_i$ is positive.

The comparison of the funds' efficiency is provided applying measures mentioned above which are evaluated for all considered mutual funds in all analyzed time spans, assuming that WIG represents market index, and TBSP is the risk-free instrument. To recognize if the Sharpe ratios are equal, we apply Jobson-Korkie test (Jobson, Korkie, 1981) with Memmel correction (Memmel, 2003), using test statistics – see (Blitz, van Vliet, 2007), (Kurach, Papla, 2014):

$$z = \frac{WS_1 - WS_2}{\sqrt{\frac{1}{T}\left[2(1-\rho_{12}) + 0{,}5\left(WS_1^2 + WS_2^2 - WS_1 \cdot WS_2 \cdot (1-\rho_{12}^2)\right)\right]}} \tag{10}$$

where for the *k*-th period of analysis (*k*=1,2), WS_i – Sharpe ratio, ρ_{12} – correlation coefficient, (*i*=1, 2).

2. Changes of the Equity and Bond Markets

In the first step of our analysis we investigate daily rates of return of indexes WIG and TBSP. Tables 1–3 contain basic characteristics of logarithmic rates of return. Bold letters denote rejection of null hypotheses.

Table 1. Basic characteristics of daily logarithmic rates of return from the both benchmarks evaluated for the whole period of analysis

Basic parameters	WIG	TBSP	Basic parameters	WIG	TBSP
min	–5.8250%	–0.6366%	range	8.8302%	1.2498%
max	3.0052%	0.6133%	standard deviation	0.9022%	0.1752%
arithmetic mean	–0.0026%	**0.0148%**	coefficient of variability	343.12	11.80
median	0.0000%	0.0091%	interquartile deviation	0.9530%	0.1958%
quartile I	–0.4495%	–0.0774%	asymmetry	**–0.7278**	**–0.2519**
quartile III	0.5036%	0.1184%	kurtosis	**4.2876**	**1.0511**

Note: Bold letters denote rejection of null hypothesis.

It is visible (Table 1) that expected rate of returns from Treasury Bonds is significantly positive while average returns from equity market is negative

[4] The description of the efficiency ratios, their application and discussion can be found in many publications. Good examples could be (Borkowski 2014), (Perez 2012), (Zamojska 2012) and Witkowska (2016).

although the null hypothesis cannot be rejected. TBSP can be treated as risk-free instrument because its variability is very low. Time series of daily rates of return from WIG and TBSP are asymmetric with positive kurtosis thus they are not normally distributed. However according to the huge number of observation we assume that probability distribution is asymptotical normal.

Table 2. Test statistics verifying the hypothesis about expected returns from both indexes in the considered periods H_0: $E(R_{WIG}) = 0$ and H_0: $E(R_{TBSP}) = 0$

Number of observations	Rates of returns from WIG	TBSP	Number of observations	Rates of returns from TBSP	TBSP
Whole period for the presidential elections: 10.10.2013–9.12.2016			Whole period for the parliamentary elections: 8.09.2014–9.12.2016		
826	–0.0597	**1.7347**	590	–0.3203	0.9267
Period before the first round of presidential elections: 8.10.2013–10.05.2015			Period after the first round of presidential elections: 11.05.2015–9.12.2016		
409	0.6326	**3.0922**	417	–0.6079	0.4903
Period before the second round of presidential elections: 8.10.2013–22.05.2015			Period after the second round of presidential elections: 25.05.2015–9.12.2016		
419	0.5652	**2.9436**	407	–0.5767	0.5054
Period before the parliamentary elections: 8.09.2014–23.10.2015			Period after the parliamentary elections: 26.10.2015–9.12.2016		
295	–0.4297	1.3199	295	–0.0541	–0.0376
Period before the new government appointment: 20.10.2014–13.11.2015			Period after the new government appointment: 16.11.2015–9.12.2016		
280	–0.5547	0.9040	280	0.2423	–0.0931
Period before entry into force 500+ Familly Program: 23.07.2015–31.03.2016			Period after entry into force 500+Familly Program: 1.04.2016–9.12.2016		
181	–0.3644	1.0793	181	0.2689	–0.5718

Note: Bold letters denote rejection of null hypothesis.

Analyzing returns from both markets in distinguished 12 periods of consideration, one may notice (Table 2) that only Treasury Bonds generated significantly positive rates of return in the periods before both rounds of presidential election and in the whole analyzed period. It is visible that change on the politic scene caused decline in the both markets. However, the performance of the equity market shows slight improvement in the periods after new government appointment and when 500+ Family Program entered into force. Such situation may be a result of investors emotions and expectations which revealed earlier and anticipated both events.

The obtained results are also validated by the tests which are used for comparison of returns in considered sub-periods (Table 3). Higher returns are observed only for TBSP before both rounds of presidential election. Equity market was characterized by the significant increase of risk after the government appointment, presidential and parliamentary elections however

the risk significantly decreased after the 500+ Family Program went into effect.

Table 3. Test statistics verifying the hypothesis about expected returns and risk of equity and bond markets in considered periods $E(R_{\text{before}}) = E(R_{\text{after}})$, $D^2(R_{\text{before}}) = D^2(R_{\text{after}})$

	Test statistics evaluated due to formulas							
	for returns:			for risk	for returns:			for risk
Index	(2)	(2)	(1)	(3)	(2)	(2)	(1)	(3)
	presidential elections, the 1st round				presidential elections, the 2nd round			
WIG	1.3649	1.1186	0.8652	**1.5179**	1.2906	1.0112	0.7960	**1.5823**
TBSP	**2.5649**	**2.5592**	**1.8116**	1.0241	**2.4287**	**2.3494**	**1.6886**	1.0381
	Parliamentary elections				Government appointment			
WIG	–0.3663	–0.3125	–0.0574	**1.3068**	–0.8394	–0.7142	–0.1330	**1.3810**
TBSP	1.3560	1.4143	0.2362	1.0040	0.9925	1.0440	0.1758	*1.1066*
	Introduction of 500+ Program							
WIG	–0.5945	–0.6945	–0.1231	***1.3649***				
TBSP	1.5723	**1.8236**	0.3247	***1.3452***				

Note: positive values of test statistics denote that returns are bigger before the considered event than after. Italic letters denote that risk was smaller after the event than before, bold – rejection of null hypothesis.

3. Mutual Funds Market

The mutual fund market is represented by five selected stability growth mutual funds. All these funds started their functioning in Poland in years 1999––2003, the "oldest" is FIO PZU, and the "youngest" FIO Credit Agricole. Analysis is provided for the sub-periods constructed around both rounds of the presidential election because in other sub-periods no essential changes was observed.

Table 4. Values of test statistics (2) verifying the hypothesis about expected returns from mutual funds in considered periods H_0: $E(R_{\text{FIO}}) = 0$

Period	CA	KBC	NN	PIO	PZU
Whole sample	0.8114	0.4773	0.2734	–0.3305	–0.1463
Before the presidential elections 1st round	**2.2363**	1.4043	1.1328	0.4378	0.4042
After the presidential elections 1st round	–0.3498	–0.5631	–0.4387	–1.0512	–0.6572
Before the presidential elections 2nd round	**2.0612**	1.2635	1.0595	0.3959	0.3531
After the presidential elections 2nd round	–0.2664	–0.4694	–0.4092	–1.0385	–0.6432

Note: Bold letters denote rejection of null hypothesis.

Analyzing expected returns form participation units of mutual funds, it is visible that before both rounds of the presidential election mutual funds generated positive returns while after – the negative ones

(Table 4). However, the null hypothesis is rejected only for FIO Credit Agricole (significantly positive returns are observed before the election).

Tabele 5. Values of statistics (1)–(3) verifying the hypothesis about expected returns and risk in considered periods $E(R_{\text{before}}) = E(R_{\text{after}})$, $D^2(R_{\text{before}}) = D^2(R_{\text{after}})$

Period	Parameter	Formulas no.	CA	KBC	NN	PIO	PZU
presidential elections, the 1st round	returns	(2)	**2.6162**	**1.8575**	1.6271	1.5188	1.0643
		(2)	**2.2442**	**2.2198**	1.4018	1.4663	1.0493
		(1)	**1.7034**	1.4246	1.0620	1.0549	0.7472
	risk	(3)	**1.3856**	**1.4007**	**1.3736**	1.0939	1.0489
presidential elections, the 2nd round	returns	(2)	**2.3801**	**1.6672**	1.5480	1.5040	1.0250
		(2)	**1.9594**	**1.9103**	1.2780	1.3892	0.9671
		(1)	1.5127	1.2561	0.9856	1.0205	0.7034
	risk	(3)	**1.4333**	**1.3515**	**1.4252**	1.1386	1.0912

Note: Bold letters denote rejection of null hypothesis.

Table 6. Parameter estimates and determination coefficients of Sharpe models

Before		After		Before		After		The whole period	
presidential elections, the 1st round				presidential elections, the 2nd round					
beta	alfa	beta	alfa	beta	alfa	beta	alfa	beta	alfa
FIO Credit Agricole									
0.2445	0.0002	**0.2405**	0.0000	**0.2441**	**0.0002**	**0.2409**	0.0000	**0.2425**	0.0001
R^2	0.6230	R^2	0.6604	R^2	0.6176	R^2	0.6641	R^2	0.6446
FIO PZU									
0.4285	0.0000	**0.3404**	0.0000	**0.4274**	0.0000	**0.3410**	0.0000	**0.3752**	0.0000
R^2	0.8493	R^2	0.7756	R^2	0.8444	R^2	0.7792	R^2	0.8010
FIO Pioneer									
0.3892	0.0000	**0.3347**	–0.0001	**0.3887**	0.0000	**0.3349**	–0.0001	**0.3563**	0.0000
R^2	0.8843	R^2	0.9078	R^2	0.8821	R^2	0.9098	R^2	0.8917
FIO Nationale-Nederlanden									
0.3323	0.0001	**0.3240**	0.0000	**0.3324**	0.0001	**0.3240**	0.0000	**0.3274**	0.0001
R^2	0.8672	R^2	0.9107	R^2	0.8651	R^2	0.9125	R^2	0.8924
FIO KBC									
0.4163	0.0002	**0.2730**	0.0000	**0.4159**	0.0001	**0.2732**	0.0000	**0.3300**	0.0001
R^2	0.7786	R^2	0.7118	R^2	0.7748	R^2	0.7153	R^2	0.7181

Note: Bold letters denote statistically significant.

The better performance of analyzed funds before the election is also proved by the results presented in Table 5. As one can see, better performance before the election was visible for FIO Credit Agricole and FIO KBC. FIO Credit Agricole and FIO Nationale-Nederlanden were characterized by significantly smaller risk before election however FIO KBC generated re-

turns with smaller volatility after the election. Null hypotheses are not rejected for FIO Pioneer, FIO PZU and FIO Nationale-Nederlanden.

Beta parameters in the single index models and CAPM are significantly positive however the values of β parameter estimates are rather small (Tables 6–7). That is connected with the fact that portfolios of stable growth mutual funds contain a great share of bonds. At the end of January 2017, Credit Agricole stable growth fund's portfolio contains only 25% of equity, FIO PZU – 30.3%, FIO Pioneer – 29.3%, FIO Nationale-Nederlanden – 35.3% and FIO KBC –38.2%. The structure of the investment funds' portfolios is also visible when beta parameter estimates are analyzed since the biggest value is observed for FIO PZU and KBC while the smallest for FIO Credit Agricole.

Table 7. Parameter estimates and determination coefficients of CAPM

Before presidential elections, the 1st round		After presidential elections, the 1st round		Before presidential elections, the 2nd round		After presidential elections, the 2nd round		The whole period	
beta	alfa	beta	alfa	beta	alfa	beta	alfa	beta	alfa
FIO Credit Agricole									
0.2171	0.0000	**0.2072**	0.0000	**0.2168**	0.0000	**0.2074**	0.0000	**0.2112**	0.0000
R^2	0.8023	R^2	0.7528	R^2	0.7998	R^2	0.7543	R^2	0.7727
FIO PZU									
0.4054	**–0.0002**	**0.3103**	–0.0001	**0.4042**	**–0.0002**	**0.3109**	–0.0001	**0.3485**	**–0.0001**
R^2	0.9109	R^2	0.8216	R^2	0.9079	R^2	0.8232	R^2	0.8514
FIO Pioneer									
0.3754	**–0.0002**	**0.3121**	**–0.0001**	**0.3752**	**–0.0002**	**0.3121**	**–0.0001**	**0.3375**	**–0.0001**
R^2	0.9083	R^2	0.9258	R^2	0.9069	R^2	0.9262	R^2	0.9088
FIO Nationale-Nederlanden									
0.3166	**–0.0001**	**0.3012**	0.0000	**0.3169**	**–0.0001**	**0.3010**	0.0000	**0.3073**	**–0.0001**
R^2	0.9173	R^2	0.9302	R^2	0.9161	R^2	0.9305	R^2	0.9235
FIO KBC									
0.3885	0.0000	**0.2474**	0.0000	**0.3879**	0.0000	**0.2475**	0.0000	**0.3042**	0.0000
R^2	0.8464	R^2	0.7054	R^2	0.8445	R^2	0.7068	R^2	0.7486

Note: Bold letters denote statistically significant parameters.

Value and significance of the alpha parameter is important when capital assets pricing models are taken into consideration since this parameter is an efficiency measure i.e. Jensen ratio. In estimated models, none of alphas is significantly positive (Table 7). The best portfolio management can be noticed for FIO Credit Agricole and KBC since alphas equaled zero. For the rest of funds Jensen ratios were significantly negative at least in the periods before election and for the whole period, it means that the mutual fund man-

agers did not earned enough return given the amount of risk they were taking.

In the next step, we compare betas from the models estimated before and after both rounds of the presidential election (Table 8). Since a positive value of the test statistics means that before the election the parameter was bigger than after the election, it is visible that the risk, measured by beta, significantly lowered after the election for all mutual funds but FIO Credit Agricole. Taking into account the quality of management, we notice that it was significantly improved after the election by FIO PZU and FIO Nationale-Nederlanden, however one must realize that Jensen alphas remained negative.

Table 8. Value of statistics comparing betas estimated in both periods H_0: $\beta_{\text{before}} = \beta_{\text{after}}$

Funds	Period	Sharpe beta		CAPM beta		CAPM alpha	
		t_1	t_2	t_1	t_2	t_1	t_2
Credit Agricole	I round	0.4255	0.4706	**1.8703**	**1.7048**	0.8368	0.6278
	II round	0.3411	0.3750	**1.7730**	1.5932	0.4965	0.3601
PZU	I round	**9.8989**	**9.7889**	**15.1606**	**13.3466**	**–2.4622**	**–1.7842**
	II round	**9.6437**	**9.5620**	**14.8252**	**12.9878**	**–2.2242**	–1.5727
Pioneer	I round	**7.7857**	**10.2830**	**10.7358**	**14.5523**	–1.5012	**–1.6749**
	II round	**7.7518**	**10.2474**	**10.7422**	**14.3758**	–1.1776	–1.2720
NN	I round	1.2969	**1.6600**	**3.2745**	**3.7870**	**–2.3184**	**–2.2070**
	II round	1.3137	**1.6850**	**3.3972**	**3.8855**	**–2.1582**	**–1.9923**
KBC	I round	**13.0273**	**16.6628**	**17.2482**	**17.9215**	0.7775	0.6650
	II round	**13.0234**	**16.6094**	**17.2693**	**17.6845**	0.4928	0.4073

Note: Bold letters denote rejection of null hypothesis.

The last stage of our investigation consists in evaluation the classical efficiency measures, which are given in Tables 9 and 10. Treynor ratio uses beta as a measure of risk but some Authors apply beta estimated from the single index model – see (Domański 2011, p. 64), (Perez 2011, p.155), and other – take beta from CAPM – see (Borowski 2014, p. 20), (Białek 2009, p. 34). Therefore, we use both approaches in our analysis. The main conclusion from our research is that the majority of portfolios were ineffective, except FIO Credit Agricole. Inefficiency appeared more often after than before the presidential election. After the election Sharpe and Treynor ratios show negative risk premium, and they usually decreased in comparison to the first analyzed time span, although Jensen alphas for FIO PZU and Nationale-Nederlanden increased in the samples containing observations after the presidential election.

Table 9. Values of the efficiency measures evaluated for mutual funds before and after both rounds of presidential election

Fund or index	Ratio: Sharpe		Treynor (β Sharpe)		Treynor (β CAPM)		Jensen alpha	
	Periods before rounds of presidential election							
	1st round	2nd round	1st round	2nd round	1st round	2nd round	1st round	2nd round
CA	**0.00392**	**–0.00015**	**0.00004**	**0.00000**	**0.00004**	**0.00000**	0.00001	0.00001
PZU	–0.05050	–0.05011	–0.00044	–0.00043	–0.00047	–0.00046	**–0.00018**	**–0.00017**
PIO	–0.05753	–0.05635	–0.00049	–0.00048	–0.00051	–0.00049	**–0.00019**	**–0.00017**
NN	–0.03614	–0.03591	–0.00031	–0.00031	–0.00033	–0.00032	**–0.00010**	**–0.00009**
KBC	**–0.00056**	–0.00459	–0.00001	**–0.00004**	–0.00001	**–0.00004**	0.00000	–0.00001
WIG	–0.00173	–0.00372	–0.00001	–0.00003	–0.00001	–0.00003	x	x
	Periods after rounds of presidential election							
CA	**–0.03148**	**–0.02775**	–0.00038	–0.00034	–0.00045	–0.00040	–0.00002	–0.00001
PZU	–0.04315	–0.04270	–0.00049	–0.00048	–0.00053	–0.00053	–0.00006	–0.00006
PIO	–0.06353	–0.06314	–0.00066	–0.00066	–0.00071	–0.00071	**–0.00037**	**–0.00012**
NN	–0.03399	–0.03284	–0.00035	–0.00034	–0.00038	–0.00037	–0.00004	–0.00001
KBC	–0.04069	–0.03642	–0.00048	–0.00043	–0.00053	–0.00048	–0.00019	–0.00005
WIG	–0.03399	–0.02817	–0.00034	–0.00028	–0.00034	–0.00028	x	x

Note: Bold letters denote that Sharpe and Treynor ratios evaluated for mutual funds are bigger than the ones calculated for WIG and Jensen ratios are statistically significant.

Table 10. Values of the efficiency measures evaluated for whole period

	Sharpe	Treynor (β Sharpe)	Treynor (β CAPM)	Jensen alpha
CA	**–0.01485**	–0.00017	–0.00019	0.00000
PZU	–0.04640	–0.00047	–0.00050	**–0.00011**
PIO	–0.05976	–0.00057	–0.00060	**–0.00014**
NN	–0.03413	–0.00033	–0.00035	**–0.00005**
KBC	–0.01894	–0.00020	–0.00022	–0.00001
WIG	–0.01938	–0.00017	–0.00017	x

Note: Bold letters denote that Sharpe and Treynor ratios evaluated for mutual funds are bigger than the ones calculated for WIG and Jensen ratios are statistically significant.

Here the question arises if changes of efficiency measures observed in comparable periods are statistically significant. To verify such hypothesis the test with statistics (10) is used for Sharpe ratio, together with the test statistics (1) and (2), applied for average values of Sharpe and Treynor ratios, evaluated for all analyzed funds. As one may notice in Table 11, neither differences of Sharpe ratios between periods nor differences between mutual fund and market index are significant. However, if average values of Treynors ratios are compared the better investment performance before the election is proved (Table 12) since the higher risk premium was obtained.

Table 11. Values of test statistics in Jobson – Korkie test

Funds or index	Comparison of Sharpe ratios			
	in two sub-periods		between FIO Credit Agricole and WIG	
	1st round	2nd round		
CA	–0.03148	–0.02775	1st round of presidential election	0.17623
PZU	–0.04315	–0.04270		
PIO	–0.06353	–0.06314	2nd round of presidential election	0.11181
NN	–0.03399	–0.03284		
KBC	–0.04069	–0.03642	in the whole period of analysis	0.20728
WIG	–0.03399	–0.02817		

Table 12. Values of test statistics for average ratios

No. of formula	Sharpe		Treynor (β Sharpe)		Treynor (β CAPM)	
	I round	II round	I round	II round	I round	II round
(2)	1.6922	1.4133	**2.7795**	**2.5495**	**2.9429**	**2.8190**
(2)	**3.9387**	**2.6980**	**5.4554**	**4.0513**	**5.5685**	**4.2752**
(1)	1.5547	1.2520	**2.4765**	**2.1578**	**2.6019**	**2.3534**

Note: Bold letters denote rejection of null hypothesis.

Conclusion

Our research show that in the whole period of analysis (covering more than three years), statistically significant and positive returns were generated only by the bond market, represented by index TBSP. The mutual stabile growth fund FIO Credit Agricole also obtained positive rates of return but only in the periods before both rounds of the presidential election. Taking into account other considered instruments we cannot reject the hypotheses about zero returns.

Comparison of the return and risk level let us conclude that:

1. returns from Treasury Bonds significantly decreased after both rounds of the presidential election,
2. risk of the bond market significantly decreased after entry into force 500+ Family Program,
3. returns from equity market did not significantly change but rates of return were lower after both rounds of the presidential election,
4. equity market risk increased after both rounds of the presidential election, the parliamentary election and appointment of the government,
5. equity market risk decreased after the program 500+ started.

References

Białek, J. (2009), *Konstrukcja miar efektywności Otwartych Funduszy Emerytalnych* (*Construction of efficiency measures for open pension funds*), Wydawnictwo UŁ, Łódź.

Blitz, D., van Vliet, P. (2007), The Volatility Effect, *Journal of Portfolio Management*, 34(1), 102–113, DOI: https://doi.org/10.3905/jpm.2007.698039.

Borowski, K. (2014), *Miary efektywności zarządzania na rynkach finansowych* (*Management efficiency measures on financial markets*), Difin, Warszawa.

Domański, C. (2011) (red.), *Nieklasyczne metody oceny efektywności i ryzyka. Otwarte fundusze emerytalne* (*Non-classic methods of risk and performance evaluation. Open pension funds*), PWE, Warszawa.

Jobson, J. D., Korkie, B. M. (1981), Performance hypothesis testing with the Sharpe and Treynor measures, *Journal of Finance*, 36(4), 889–908, DOI: https://doi.org/10.1111/j.1540-6261.1981.tb04891.x.

Kurach, R., Papla, D. (2014), Inwestycje alternatywne w portfelach otwartych funduszy emerytalnych (Alternative investments in open pension funds' portfolios), *Optimum. Studia Ekonomiczne*, 1(67), 71–81, DOI: https://doi.org/10.15290/ose.2014.01.67.06.

Memmel, C. (2003), Performance hypothesis testing with the Sharpe ratio, *Finance Letters*, 1(1), 21–23.

Perez, K. (2012), *Efektywność funduszy inwestycyjnych* (*Efficiency of mutual funds*), Difin, Warszawa.

Witkowska, D. (2016), *Zmiana warunków funkcjonowania a efektywność inwestycyjna otwartych funduszy emerytalnych* (*The change of functioning conditions vs investment efficiency of open pension funds*), Wydawnictwo UŁ, Łódź.

Zamojska, A. (2012), *Efektywność funduszy inwestycyjnych w Polsce. Studium teoretyczno-empiryczne* (*Efficiency of mutual funds in Poland. Theoretical-empirical study*), C.H. Beck, Warszawa.

Jak wpływa zmiana partii rządzącej na efektywność rynku finansowego w Polsce

Z a r y s t r e ś c i. Rynek finansowy wydaje się być wrażliwym na zmiany polityczne, zwłaszcza gdy zmiana partii rządzącej wiąże się z zasadniczymi zmianami koncepcji rozwoju gospodarczego. Taka sytuacja miała miejsce w Polsce w 2015 roku w wyniku wyborów prezydenckich i parlamentarnych. Celem naszych badań jest analiza zmian zachodzących na rynku, reprezentowanym przez niektóre stabilne, otwarte fundusze inwestycyjne oraz indeksy giełdowe: WIG i TBSP. Przeprowadzono analizę, stosując modele jednoczynnikowe i CAPM, klasyczne miary efektywności inwestycji i wnioskowanie statystyczne.

S ł o w a k l u c z o w e: otwarte fundusze inwestycyjne stabilnego wzrostu; efektywność inwestycji; model Sharpe; CAPM; Sharpe, Treynor i Jensen.