Financial Internet Quarterly „e-Finanse" 2015, vol.11 / nr 4, s. 64 - 73
DOI: 10.14636/1734-039X_11_4_006

HIGH PROPENSITY TO PAY DIVIDENDS BY STATE-CONTROLLED COMPANIES IN POLAND. TUNNELING OR MATURITY EFFECT?

Mieczysław Kowerski[1]

Abstract

Usage of a random effects panel logit model have shown in this paper that the high propensity to pay dividends by the state-controlled companies quoted on the Warsaw Stock Exchange over the last years was not a result of the tunneling effect but was the maturity effect. The state-controlled companies which pay dividends fulfil the maturity effect criteria as they are big, profitable, have low investment opportunities and financial leverage, and are characterised by low risk associated with investing in their shares. The additional evidence of a reasonable and stable dividend policy pursued by the state-controlled companies are: payout ratio on the level of slightly more than 50% and lower by almost 8 percentage points than in the other companies; and relatively rare use of the reserve capital for dividends. However, state-controlled companies listed on the WSE are mostly commercial and of a fiscal nature for the state, which may create a temptation for tunneling.

JEL classification: E44, G17, G35
Keywords: Warsaw Stock Exchange, state-controlled companies, dividend policy, maturity effect, tunneling effect

Received: 26.05.2015 Accepted: 08.03.2016

1 Department of Macroeconomics, University of Information Technology and Management in Rzeszów, mkowerski@wsiz.rzeszow.pl.

Introduction

Studies of developed and emerging capital markets show that one of the basic factors determining the propensity to pay dividends is the maturity effect (Grullon et al., 2002; DeAngelo et al., 2006). Mature companies are usually stable, big (in terms of employment, income, and value of assets), profitable, and with a growing free cash flow which exceeds their investment needs so they are more willing to pay dividends than less mature companies (Jensen, 1986).

The maturity effect itself can be explained in basic financial theories connected with dividend policy. According to the lifecycle theory of dividends, a company starts to pay them out when it has passed from a high growth rate to a low growth rate, in other words – from the immaturity to the maturity phase in its life cycle (Damodaran, 2007, p. 1022).

According to the agency theory (Jensen & Meckling, 1976) along the process of company maturation grows the agency conflict and the company should pay dividends in order to reduce the conflict. It is particularly strong in state-controlled companies, where a double principal–agent problem exists and only a high and continuous stream of paid dividends can solve it (Gugler, 2003, p. 1301).

Yet recent studies of emerging markets, especially in the case of China, have shown that the high propensity to pay dividends and high level of dividend payments by companies controlled by the state are a result of tunnelling, extraction of cash from the firms by the state, which is called a tunneling effect (Li, Chen & Chen, 2013).

The Warsaw Stock Exchange (WSE) is an emerging market. In 2013 there were only 15 companies listed there which were directly controlled by the state (3.7% of the total amount of listed domestic companies), but the capitalisation of these companies accounted for 39% of the capitalization of the whole Polish stock market and their share in dividend payments reached 56.5%. In 2013 the propensity to pay dividends by state-controlled companies was two and half times higher (73.3%), than in the other companies (31%) .

The question arises then: whether such a high propensity to pay dividends by the companies controlled by the Polish government was the result of the maturity effect or whether it was due to the tunneling effect caused by the budget problems of those days.

To answer the above question, a random effects panel logit model of the propensity to pay dividends with different proxies of maturity as explanatory variables was estimated, using data from the years 1996–2009. This model became a tool for forecasts of dividends payments by the state-controlled companies in 2013. A low accuracy of forecasts would have meant that the maturity factors had no influence on propensity and the other factors, including tunneling, determined the dividend decision of the state-controlled companies. A high accuracy of forecasts would have testified in favour of the maturity effect.

The obtained results tended to confirm that the state-controlled companies listed on the WSE are more likely to pay higher dividends because they meet the criteria of the maturity effect and not because the state, as the owner, uses tunneling to deprive the companies of free cash flow which is instead used for the current activities of the state.

The rest of the article is organised in such a way that the second chapter presents a review of the literature on the results of research on the propensity to pay dividends by state-controlled companies in selected countries. The third section discusses the adopted methodology. The fourth presents the data used in the analysis, while the fifth chapter presents the results of the study and formulates the answer to the question here.

Literature review

The agency explanation of maturity effect

The problem of costs and agency conflicts occurs when management has too much cash. There is a risk that this money may be inefficiently invested, which could become a root of a conflict between the management and the minority shareholders. Payment of dividends reduces the level of the agency conflict between the board of directors and shareholders (Easterbrook, 1984, p. 652).

Agency problems do not occur in small, immature companies because:

1) they have so many effective investment opportunities that their growth is bringing increasing profits; both shareholders and managers are happy,
2) they have to raise external capital, which means

that they are monitored by banks and other institutions,

3) entrepreneurs and managers have significant shares. Therefore, their interests coincide with the interests of the remaining shareholders.

But, as the companies mature, the agency conflicts grow. Therefore, they should pay dividends. Mature companies are usually stable, big (in terms of employment, income, and value of assets), profitable, with a growing free cash flow exceeding investment needs (Jensen, 1986). Quite often the boards of such companies are tempted to waste resources by using them for their own needs (salary, bonuses, unprofitable investments).

DeAngelo et al. (2006, p. 250, 252) characterised the conflict based on free cash flow as a conflict associated with the retention of profits and found that it occurred within mature companies. Therefore, the optimal dividend policy of such companies should rely on reducing unprofitable or weakly profitable investments in order to increase dividend payments.

Empirical verification of the maturity effect was conducted by Grullon et al. (2002, p. 396). They confirmed that along with maturation, investment (growth) opportunities of companies decrease, causing a reduction in capital spending. Thus, more resources remain available for the payment of dividends.

At the stage of maturity, the company's ability to generate free cash flow outweighs the possibility of finding profitable investment projects. The optimal solution for such companies is the payment of cash in the form of dividends.

Studies of developed and emerging capital markets show that the state-controlled companies have a higher propensity to pay dividends, which are more frequent than in the other groups of companies paying high dividends. The state-controlled companies quoted on stock exchanges are usually mature (La Porta et al., 1999; Truang & Heaney, 2007; Adamczyk, 2014). Still, according to several authors there is an additional explanation of high propensity to pay dividends – a double principal–agent conflict. The citizens are the ultimate owners of the state-controlled companies. However, they do not control them directly. Their elected representatives do (or should do) this. The citizens cede their control functions to the politicians, who quite often represent the interests of their party and not the society as a whole. In addition to the traditional conflict between the management and the politicians (the government) controlling the company, there arises an additional conflict between the politicians and the ultimate owners (the citizens). Only high and continuously paid dividends can convince the final owners (the citizens) that the company is functioning properly (Gugler, 2003, p. 1301).

The tunneling effect

The term "tunnelling" refers to the transfer of resources out of a company to its controlling shareholder (Johnson et al., 2000, p. 23). The tunneling can take the form of salary transfer, subsidised personal loans, non-arms-length asset transactions and – in some cases – outright theft (Johnson et al., 2000, p. 24). In the opinion of some authors, particularly in the emerging markets, payments of high dividends by the state-controlled companies are of the same character. Chinese studies have shown that the high propensity to pay dividends and the high level of those payments by the companies controlled by the state are a result of tunneling or extraction of cash from firms (Li, Chen & Chen, 2013).

In the case of dividends, the tunneling effect can be explained by the fact of the state first introducing attractive enterprises on the stock market and then being eager to reap the benefits (Lam, Sami & Zhou, 2012, p. 214). These are both received from dividends as well as from the taxes payed by the other shareholders (Wang, Manry & Wandler, 2011, p. 368). Among the variety of the forms of tunneling, the dividend payment might be one of the means of legal tunneling. This is contrary to the opinion that a cash dividend may alleviate the agency problem between the majority shareholder and minority shareholders (Lee & Xiao, 2004, p. 17).

Special attention should be drawn to the so-called post-socialist countries, where previously almost exclusively state-owned companies functioned. These companies are gradually being privatised, although the state sector still bears great importance. The best example here is China. The stock exchanges formed in 1990 in Shenzhen, and in 1991 in Shanghai, according to some were created by the government as a tool ("vehicle") for fundraising by the state-owned enterprises. In 2010, despite the decline in recent years, the direct and indirect participation of the Chinese state in companies listed on Chinese stock exchanges was 59.9% (Li, Chen & Chen 2013, p. 4).

Other examples could be the former socialist states

of Central Europe. According to the Deloitte CE TOP 500 ranking (2014) of 2013, amongst the 500 largest manufacturing-services companies (banks and insurance companies were not included in the surveys) of Central Europe and Ukraine less than 19% remain under the control of the state. But they create the 30% of the revenue of all the largest companies from the region. They are mostly companies in so-called strategic sectors (energy, petroleum, transport and public utilities). The leader is PKN ORLEN (Poland) and in the twenty largest state companies of the region there are 12 companies from Poland (Adamczyk, 2014, pp. 18–19). These companies may potentially be a subject of tunneling.

The results of the selected studies on state-controlled dividend policy

The research of dividend policies of the state-controlled companies most frequently sought to answer questions such as whether these companies are more likely to pay dividends than others (have a higher propensity to pay) and whether the payout level of these companies is higher than in the case of companies with other owners. The question of the propensity to pay dividends was most commonly solved by means of qualitative response models with a dependent variable adoption of the value of 1 if the company was paying a dividend and a value of 0 in the opposite situation. In a set of explanatory (independent) variables there was a variable adopting a value of 1 if the state was the control shareholder of the company, and a value of 0 in the opposite situation, or a variable that described the percentage of the state share in the company's capital. To estimate the parameters of such models a logit approach was most commonly used. The first logit models used to study the propensity to pay dividends were proposed by Fama and French (2001). They also suggested three main factors influencing the dividend paying decision (size, profitability and investment opportunities of the company).

Questions about the level of payment were most often analysed using Lintner's partial adjustment model (Lintner, 1956), in which the profit in the year t and the dividend in the year t–1 were applied as the explanatory variables of a dividend in the year t.

Gugler (2003) analysed 214 companies between 1991 and 1999, selected from the largest Austrian companies, including 45 state-controlled entities. To analyse the level of payments he applied the Lintner model "enriched" with a 0 – 1 explanatory variable (DST) adopting a value of 1 when the state was the largest shareholder, and of 0 when otherwise. The estimated value of a coefficient on the DST variable was positive and statistically significant, which meant that the state-controlled companies payed higher dividends. The author also estimated two basic characteristics of the Lintner model: (1) the target payout ratio, which amounted up to 42.9% for state-controlled companies (the highest and statistically significantly higher than the target payout ratio for the remaining analysed groups of companies) and (2) the smoothing ratio, that was also the highest for state-controlled companies among the analysed groups of companies (Gugler, 2003, p. 1314). This meant that the Austrian state-controlled companies not only payed the highest dividends, but also tried to "smooth" them and paid dividends on a regular basis, with similar values. The author also estimated a logit model in which a dependent variable took the value of 1 if the company lowered the dividend in year t compared with the year t–1, and of 0 if otherwise. The coefficient on the variable describing the involvement of the state within the company was negative (although statistically insignificant), which confirmed the reluctance of the state-controlled companies to reduce dividends (Gugler, 2003, pp. 1315–1316).

Similar research was carried out by Szilagyi and Renneboog for Dutch companies (2008). They analysed 150 non-financial companies listed for at least 3 years on Euronext Amsterdam or the newer Dutch market NMAX in the years 1996 – 2006 (a total of 962 observations). These companies represented more than 2/3 of all companies quoted on stock exchanges in Amsterdam, and their market capitalisation was 90% of the capitalisation for these exchanges. In the estimated models the coefficients on the variable describing the participations of the state in the companies' capitalization were positive, which would confirm the hypothesis that a higher fraction of shares belonging to the state means the higher propensity to pay dividends and a higher level of payoff. Still, these coefficients were found to be statistically insignificant, which weakened the formulated proposals.

The logit models of the dividend decision estimated by Truong and Heaney (2007) on the basis of observations coming from 37 countries in 2004 (8279) proved that outside the United States the companies with a large (at least 5%) involvement of the state are more likely to pay

dividends than other companies.

Lam et al. (2012) collected data from 1712 Chinese companies quoted in the years 2001 – 2006, primarily on stock exchanges in Shenzhen and Shanghai, but also on the exchanges in Hong Kong, New York, London and Singapore (7519 observations). Using these data, they built a linear model of a dividend payout ratio with variables describing the size of the companies, their debt, profitability, cash, investment opportunities, risk of investing in shares of the company (measured by the beta coefficient) and also the ownership structure; the state involvement was measured by the fraction of the state shares in a company's total capitalisation. In the estimated linear regression model of the dividend payout ratio, the coefficient on the ownership structure variable was positive and significant: the greater fraction of shares belonging to the state in the company was, the higher the dividend payout ratio became.

Wang et al. (2011, p. 369–371) analysed 4864 observations from companies listed on the Shanghai Stock Exchange between 1998 and 2008 which paid dividends over at least two succeeding years. In the estimated logit models of the dividend decision coefficient on the variable describing the fact of state control (x = 1) or the lack of it (x = 0) was positive and statistically significant, indicating that the state-controlled companies had a higher propensity to pay dividends. Also, the Lintner model "enriched" by a 0–1 explanatory variable describing the control of the company by the state showed that the value of the dividend per share is higher in the case of a company controlled by the Chinese state.

These research findings indicate that both in the developed and emerging markets state-controlled companies have a higher propensity to pay dividends than the other companies. In the case of developed markets, state-controlled companies also try to "smooth out" dividends so that they do not change their value regardless of financial performance.

Methodology

To answer the question as to whether the higher propensity to pay dividends by the companies listed on the WSE with state shares as of 2013 was a result of "tunneling" by the state, or whether it was due to the effect of maturity a two-stage procedure was applied.

During the first stage, a random effect panel model (Maddala, 2006, pp. 645–648) of the propensity to pay dividends by domestic public companies' quoted on the WSE in the years 1995–2009 was proposed:

$$Y^*_{i,t} = \alpha_i + \beta_0 + \boldsymbol{x}'_{i,t-1}\boldsymbol{\beta} + \varepsilon_{i,t}, \quad (1)$$

where:

$Y^*_{i,t}$ – unobserved propensity to pay dividends for i-th company in the year *t,*

$\boldsymbol{x}'_{i,t-1}$ – [(k+1) x 1] vector of values on k explanatory variables (plus constant term) for the i-th company in the year *t–1*.

$$x'_{i,t-1}\boldsymbol{\beta} = \beta_1 X_{1,i,t-1} + \beta_2 X_{2,i,t-1} + \cdots + \beta_k X_{k,i,t-1}, \quad (2)$$

The optimal set of explanatory variables was found with the stepwise regression method. This optimal set embraced different proxies of maturity and control variables.

$\boldsymbol{\beta}$ – vector of coefficients

α_i – random individual effect for the i-th company

A propensity to pay dividends is not directly observed, however we can assume that if it exceeds a certain threshold C (cutpoint), the company will pay dividend. Otherwise, it will not pay (Owczarczuk, 2012, p. 65):

$$Y_{i,t} = \begin{cases} 1, & Y^*_{i,t} \geq C = 0 \\ 0, & Y^*_{i,t} < C = 0 \end{cases}, \quad (3)$$

where:

$Y_{i,t}$ – dependent variable taking value 1 if i-th company in *t* year paid the dividend and value 0 if otherwise.

Then, the random effects panel logit model (Cameron & Trivedi, 2013, pp. 360–364), was estimated:

$$\mathrm{Log}\,itY_{i,t} = \alpha_i + \beta_0 + \boldsymbol{x}'_{i,t-1}\boldsymbol{\beta} + \varepsilon_{i,t}, \quad (4)$$

where:

$\mathrm{Log}\,itY_{i,t} = \ln\left(\frac{Pr(Y_{i,t}=1)}{Pr(Y_{i,t}=0)}\right)$ – logarithm of odds ratio (probability of paying dividend divided by the probability of not paying dividend)

$\varepsilon_{i,t}$ – disturbance term with the standardised logistic distribution.

It is assumed the lack of correlation between

distributions of α_i, and $\varepsilon_{i,t}$ for i-th observation and with explanatory variables (Witkowski, 2012, p. 301).

The formulated model is estimated with the maximum likelihood method.

The existence of specific random effects was verified with the LR test. The significance of each coefficient was verified by z statistics with N (0 ; 1) distribution. The significance of the whole set of explanatory variables was verified by the Wald test. The assessment of the measure of goodness of fit was performed using the McFadden determination coefficient pseudo R^2 (Maddala, 2006, p. 378).

The specified model allows for calculating the probability of dividend payout by a company *i* in a given year *t* (assuming that the individual random effect is equal to 0):

$$p_{i,t} = \frac{\exp \mathrm{Log}\, itY_{i,t}}{1 + \exp \mathrm{Log}\, itY_{i,t}} = \frac{\exp\left(b_0 + \boldsymbol{x}'_{i,t}\boldsymbol{b}\right)}{1 + \exp\left(b_0 + \boldsymbol{x}'_{i,t}\boldsymbol{b}\right)}, \quad (5)$$

where:

b – vector of estimated values of vector of $\boldsymbol{\beta}$ coefficient**.**

During the second stage, the forecasts of the probabilities to pay dividends were estimated, using the assessed model and the data of explanatory variables for state-controlled companies in 2012. Due to the fact that the sample used for the estimation of the model was disproportionate (unbalanced) and the observations concerning dividend payouts constituted 30.6%, the fitted values of calculated probabilities of dividend payouts may be underestimated (Gruszczyński, 2002, p. 80). In the case of the knowledge of the fraction of dividend payers in general population the special correction of fitted probabilities can be applied (King & Zeng, 2001, p. 144) but we do not know this "true value". This is why the following procedure of forecasting has been proposed:

$$Y_{i,t} = \begin{cases} 1 \Rightarrow \text{company will pay dividend}, & if \quad \hat{p}_{i,t} \geq 0{,}306 \\ 0 \Rightarrow \text{company will not pay dividend}, & if \quad \hat{p}_{i,t} < 0{,}306 \end{cases}$$

Because the explanatory variables are different proxies of maturity, low accuracy of forecast means that the maturity factors have no significant influence on propensity to pay dividends. Thus, other factors (including tunneling) determined the dividend decision of state-controlled companies. The high accuracy of forecast testifies in favour of maturity effects.

Data

The random effects panel logit model was estimated on the data from the domestic companies listed on the Warsaw Stock Exchange in 1995–2009. Only the companies whose shares were listed for the entire year before the year of the dividend decision were taken into account. The set of domestic companies listed for the entire year did not include national investment funds, due to a different method of financial accounts. The set also did not comprise companies with negative values of own equity and companies with zero revenue from sales of products, services, goods and materials (companies which did not conduct operational activities in a given year). The set comprised companies which were listed during the entire analysed period (whole timeframe) and companies which were quoted only during a sub-period due to the fact that they became available on the stock exchange later or (and) they were excluded from it or in some sub-periods did not meet the qualification criteria for the set (for example they had negative own equity). Thus, an unbalanced panel was obtained. It was composed of 399 companies within 14 years consisting of 2,263 observations – companies-years (observations per group: min = 1, avg = 5,67, max = 14).

The set of explanatory variables was chosen with the stepwise regression method from 85 variables describing the economic and financial situation of analysed companies and macroeconomic variables describing the economic situation of Poland.

At the end of 2013, 20 companies were listed on the WSE in which the state (Minister of Treasury and Minister of Economy) was a direct shareholder. Only in 15 companies the amount of state shares exceeded 27.5%, allowing a direct control of the state of these companies. In the three other companies the state was a minority shareholder, while the two remaining were indirectly state-controlled by using other directly controlled companies.

The subject of further, detailed study will be 15 companies listed on the stock exchange in Warsaw which are directly controlled by the state. At the end of 2013, these companies were admittedly only 3.7% of all domestic companies listed, but their capitalisation amounted to 231.9 bln PLN, representing 39.1% of the capitalization of the whole stock market. In 2013, dividends were paid by 11 state-controlled companies (73.3% of all state-controlled companies) and 125 other companies (31.0% of other companies). But the value of dividends paid by

Table 1: Dividend strategies of state-controlled companies listed on the Warsaw Stock Exchange in 2013

Specification	Domestic companies				Companies paying dividends in 2013			
	Total	Companies directly controlled by the state	Other companies	Relation of companies directly controlled by the state to total (%)	Domestic companies total	Companies directly controlled by state	Other companies	Relation of companies directly controlled by the state to total (%)
Capitalisation 31.12. 2013 (bln PLN)	593,5	231,9	348,2	39,1	454,1	217,8	236,3	48
Net profit in 2012 (bln PLN)		19,8			31,9	19,1	12,8	60
Profit for distribution in 2012*(bln PLN)		21,4			33,5	20	13,4	59,8
Dividend (bln PLN)	19,4	11	8,4	56,5	19,4	11	8,4	56,5
Relation dividend to net profit in (%)		55,3			60,8	57,3	66	94,3
Payout ratio (%)**		51,3			58	54,8	62,7	94,5
Dividend yield (%)	3,3	4,7	2,3	144,7	4,3	5	3,6	117,3
Number of companies paying dividends in 2013	136	11	125	8,1	136	11	125	8,1

* if a company pays a dividend only from its net profit in the last accounting period: profit for distribution = net profit; if a company pays a dividend using (additionally or only) retained earnings (non-distributed profits for previous years): profit for distribution = net profit + retained earnings used for dividends; if a company noted a loss in the last accounting period: profit for distribution = retained earnings used for dividends.

**relation of dividend to profit for distribution

Source: Own calculations

companies controlled by the state in 2013 amounted to 11.0 bln PLN, representing 56.5% of all dividends. The state-controlled companies that paid dividends tended to have a 7.9 percentage point lower payout ratio than other companies, but a 1.4 percentage point higher dividend yield ratio.

Results

The applied stepwise regression method permitted us to find the optimal set of 10 explanatory variables. All estimated coefficients of random effects panel logit model were significant on the level of 0.05. According to the Wald test the whole set of explanatory variables was significant. According to the LR test specific random effects existed within the studied panel data, so the panel logit model with specific random effects was a proper tool of estimation.

The estimated values and signs of coefficients on explanatory variables show that the maturity effect was the main factor of the decisions to pay dividends by the companies quoted on the WSE in the years 1995–2009. Companies which had been more profitable, bigger, older, with lower investment opportunities and financial leverage, characterised by lower risk associated with investing in their shares and which had paid a dividend in the previous year (t–1) were more prone to decide to

Table 2: Results of the estimation of panel logit model with specific random effects of dividend decisions depending on the companies' economic and financial situation and state tax policy in the years 1995–2009

Variables and statistics	Coefficients	P – value
Constant	-2,543	0,002
Companies' dividend decisions in the year *t–1*. Dummy variable taking the value of 1 if in the year *t–1* the company paid the dividend and the value of 0 if otherwise	2,08	<0.001
Profitability in the year *t–1*. Return on equity ratio	0,059	<0.001
Size of company at the end of year *t–1*. Natural logarithm of total assets in fixed prices	0,246	<0.001
Company maturity at the end of year *t–1*. The ratio of stock capital to equity	-1,783	<0.001
Investment opportunities at the end of year *t–1*. The ratio of market value to equity	-0,186	<0.001
Financial leverage at the end of year *t–1.* The ratio of equity to total assets	1,246	0,009
Risk ratio 1 in year *t–1*. Quotient of the difference between the highest and the lowest share price to the maximum price in year *t–1*	-0,013	0,019
Risk ratio 2 in year *t–1*. Quotient of the difference between the share price at the end of year and the lowest share price to the maximum price in year *t–1*	-0,015	<0.001
A banking sector company, Dummy variable taking the value of 1 if the company is a bank in year *t* and the value of 0 if otherwise	1,673	<0.001
Tax preference ratio for dividends in the year *t*	1,984	0,017
Wald test $\chi^2(10)$	522,37	<0.001
LR test of specific random effects $\chi^2(1)$	19,65	<0.001
McFadden determination coefficient pseudo R^2	0,2392	

Source: Own calculations in STATA

pay dividends in year t. Banks were more likely to pay dividends than other companies. Companies were more prone to pay out dividends in periods of a more profitable dividend tax policy.

The probabilities of dividend payments in 2013 for 13 state-controlled companies[1] were estimated, using the model and taking the explanatory variables values of companies controlled by the state in 2012.

Only for 1 company the probability of payout was less than 0.306, which indicated that only this company would have not paid a dividend. In 2013, out of the 13 analysed companies, two did not pay dividends. The forecast was not correct only in the case of one company (LOTOS) which did not pay a dividend in spite of the probability calculated on the basis of the model exceeding 0.306. The total accuracy of predictions was 92.3%.

These calculations indicate that the analysed companies pay dividends not because their owner is the state, but because they meet the criteria of mature companies (they fulfil the maturity effect), because they are:

1) bigger – in 2012, the state-controlled companies had a capitalization which was almost six times higher than other companies,

2) much less risky – in 2012, the risk quotient measure of the difference between maximum and minimum prices to the minimum price for the state-controlled companies was about 1/3 less than for other companies,

3) more profitable – in 2012, only 1 company controlled by the state (7.7% of those analysed) suffered a loss, while in the other categories, more than 30% of the companies had a loss. The return on equities of state-controlled companies is more than 40% higher than other companies making profits,

4) devoid of large investment opportunities – capitalisation to the value of equity ratio in 2012 for state-

1 Two companies were not analyzed because shares were not listed for entire year of 2012

Table 3: Forecasts of dividend payments by state-controlled companies in 2013

Company	Probability of dividend payment in 2013	Forecast of dividend payment in 2013*	Dividend in 2013	Accuracy of forecast **
AZOTYTARNOW	0,503	1	1	1
CIECH	0,005	0	0	1
ENEA	0,933	1	1	1
GPW	0,816	1	1	1
JSW	0,911	1	1	1
KGHM	0,97	1	1	1
LOTOS	0,546	1	0	0
PGE	0,851	1	1	1
PGNiG	0,572	1	1	1
PKNORLEN	0,634	1	1	1
PKOBP	0,969	1	1	1
PZU	0,943	1	1	1
TAURONPE	0,88	1	1	1
Average for state-controlled companies	0,797			

* 1 means the forecast of company paying dividend

**1 means that the forecast was accurate and 0 otherwise

Source: Own calculations with the dividend decision model

controlled companies was 12.6% less than for the others,

5) mature – in the sense of stock capital to equity ratio,

6) burdened with lower financial leverage.

Conclusions

The presented results of the calculations tend to conclude that the state-controlled companies listed on the Warsaw Stock Exchange are more likely to pay higher dividends because they meet the criteria of the maturity effect and not because the state as owner uses tunneling to deprive them of free cash flow which is used up for the current activity of the government. A payout ratio which is lower by almost 8 percentage points from the other companies and only slightly more than 50%, as well as the relatively rare use of the reserve capital for dividends (Kowerski, 2013, pp. 281-285) is evidence of a reasonable and stable dividend policy pursued by the state-controlled companies. Thus, the answer to the question formulated in the introduction to this paper is: "High propensity to pay dividends by companies controlled by the Polish government was the result of the effect of maturity".

However, it should be noted that the state-controlled companies listed on the WSE (except in the energy and fuel sectors) do not carry out tasks directly connected with state security but are commercial companies, having a fiscal nature for the state. This, perhaps, also helps in creating economic policies that might actually create the temptation of tunneling. Therefore, a close watch should be kept on the actions of the state-controlled companies in terms of dividend policy.

References

Adamczyk, C. (2014). Kapitał zagraniczny dominuje w regionie, 500 największych firm Europy Środkowo – Wschodniej. *Rzeczpospolita*, Wrzesień, p. 18–19.

Cameron, A.C., Trivedi, P.K. (2013). *Regression Analysis of Count Data*. Cambridge: Cambridge University Press.

Cramer, J.S. (1999). Predictive Performance of the Binary Logit Model in Unbalanced Samples. *Journal of the Royal Statistical Society: Series D (The Statistician), 48(1)*, 85–94.

Damodaran, A. (2007). *Finanse korporacyjne. Teoria i praktyka.* Wydanie II. Gliwice: Helion.

DeAngelo, H., DeAngelo, L., Stulz, R. (2006). Dividend Policy and the Earned/Contributed Capital Mix: A Test of the Life-cycle Theory. *Journal of Financial Economics*, 81(2), 227–254.

Deloitte CE TOP 500 (2014). Retrieved from http://www.deloitte.com/pl/cetop500.

Easterbrook, F.H. (1984). Two Agency – Cost Explanations of Dividends. *American Economic Review*, 74(4), 650–659.

Fama, E.F., French, K.F. (2001). Disappearing Dividends: Changing Firm Characteristics or Lower Propensity to Pay? *Journal of Financial Economics*, 60(1), 3–43.

Grullon, G., Michaely, R., Swaminathan, B. (2002). Are Dividends Changes a Sign of Firm Maturity? *Journal of Business*, 75(3), 387–424.

Gruszczyński, M. (2002). *Modele i prognozy zmiennych jakościowych w finansach i bankowości.* Warszawa: Oficyna Wydawnicza Szkoły Głównej Handlowej w Warszawie.

Gugler, K. (2003). Corporate Governance, Dividend Payout Policy, and the Interrelation between Dividends, R&D and Capital Investment. *Journal of Banking & Finance*, 27(7), 1297–1321.

Hedensted, J.S., Raaballe, J. (2008). Dividend Determinants in Denmark. *Working Paper, University of Aarhus*. Retrieved from http://ssrn.com/abstract=1123436.

Jensen, M.C. (1986). Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers. *American Economic Review*, 76(2), 323–329.

Jensen, M.C., Meckling, W. (1976). Theory of the Firm: Managerial Behaviour, Agency Costs and Ownership Structure. *Journal of Financial Economics*, 3(4), 305–360.

Johnson, S., La Porta, R., Lopez-de-Silanes, F., Shleifer, A. (2000). Tunneling. *American Economic Review Papers and Proceedings*, 90(2), 22–27.

King, G., Zeng, L. (2001). Logistic Regression in Rare Events Data. *Political Analysis*, 9(2), 137-163.

Kowerski, M. (2011). *Ekonomiczne uwarunkowania decyzji o wypłatach dywidend przez spółki publiczne*. Kraków-Rzeszów-Zamość: Wydawnictwo Konsorcjum Akademickie.

Kowerski, M. (2013). Dywidenda a wynik finansowy w ostatnim roku obrotowym. *Prace Uniwersytetu Ekonomicznego we Wrocławiu 291*, 278–288.

Lam, K., Sami, H., Zhou, H. (2012). The Role of Cross-listing, Foreign Ownership and State Ownership in Dividend Policy in an Emerging Market. *China Journal of Accounting Research*, 5(3), 199–216.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R. (1999). Corporate Ownership Around the World. *The Journal of Finance,* LIV(2), 471–516.

Lee, C-W, J., Xiao, X. (2004). *Tunneling Dividends*. Retrieved from http://ssrn.com/abstract=693361.

Lintner, J. (1956). Distribution of Incomes of Corporation Among Dividends, Retained Earnings and Taxes. *American Economic Review*, 46(2), 97–113.

Li, S., Chen, W., Chen, C. (2013). Tunneling or Alignment? The Interaction between Shareholding Ratios, Control Shareholders Behavior and Firm Performance in a Transitional Economy - Evidence from China. *Albuquerque, New Mexico, USA, Southwestern Finance Association Annual Conference.*

Maddala, G.S. (2006). *Ekonometria*. Warszawa: PWN.

Owczarczuk, M. (2012). Modele ze zmienną ukrytą. In M. Gruszczyński (Ed.), *Mikroekonometria. Modele i metody analizy danych indywidualnych* (pp. 63–70). Warszawa: Oficyna Wolters Kluwer Business.

Szilagyi, G., Renneboog, L. (2008). How Relevant is Dividend Policy Under Low Shareholder Protection? *ECGI - Finance Working Paper 128*. Retrieved from http://ssrn.com/abstract=925190.

Truong, T., Heaney, R. (2007). Largest Shareholder and Dividend Policy Around the World. *The Quarterly Review of Economics and Finance*, 47(5), 667–687.

Wang, X., Manry, D., Wandler, S. (2011). The Impact of Government Ownership on Dividend Policy in China. *Advances in Accounting, incorporating Advances in International Accounting, 27(2)*, 366–372.

Witkowski, B. (2012). Modele danych panelowych. In M. Gruszczyński (Ed.), *Mikroekonometria. Modele i metody analizy danych indywidualnych* (pp. 267–308). Warszawa: Oficyna Wolters Kluwer Business.