OWNERSHIP CATEGORIES AND INVESTMENT PATTERNS AFTER MASS PRIVATIZATION IN BULGARIA AND THE CZECH REPUBLIC

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Abstract

This paper studies the emerging ownership and investment patterns of listed companies during the first years after mass privatization (Bulgaria) and after around ten years after mass privatization (the Czech Republic). It explores firm-level data over the period 1998-2003. We apply accelerator-cash flow model and q-model to cash-flow investment sensitivity. In the Bulgarian sample, contrary to the expectations firms controlled by foreign firms are financially constrained. Firms controlled by state-owned holding company show financial re-allocation investment pattern, while firms under control of privatisation fund have inertial investment behaviour. In the Czech Republic, the estimates of the q-model show that companies controlled by foreign investors are less financially constrained and have profit-maximization behavior, firms controlled by the National Property Fund have insignificant financial re-allocation, and firms under control of other domestic firms are most financially constrained. However, the accelerator model does not confirm these results for the firms under control of other domestic firms.

Keywords: investment, cash flow, ownership, corporate governance, post-communist transition

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I. Introduction

In transition economies, the efficient re-allocation of capital is crucial for the success of reforms. This paper examines the institutional determinants of post-privatization investment behaviour of listed companies in Bulgaria during the first years after mass privatization and in the Czech Republic after around ten years after mass privatization. It explores firm-level data over the period 1998-2003. It we apply accelerator-cash flow and q-models to study cash-flow investment sensitivity. The study contributes to the literature of corporate governance and investment performance in transition economies: (i) identifying ownership structures in the early and late postmass privatisation periods in Bulgaria and the Czech Republic; (ii) examining the emerging investment patterns correlated with ownership category. Section 2 discusses the hypotheses and econometric modelling of investment behaviour. Section 3 describes data and ownership categories. Section 4 analyses the investment patterns. Section 5 discusses main results and unresolved questions for further research.

II. Hypotheses and Econometric Modeling of Investment Behavior

A. Hypotheses

This research focuses on the institutional determinants of investments in transition economies and the association between investment and ownership in particular. However, the basic investment models applied in the literature are "institutions free".[1] The accelerator models, the neoclassical models, and expectations theories (e.g. q- theory), all treat the institutional environment as given, constant, and not on the research agenda. In the Modigliani-Miller approach, the firm is viewed as a black box with key characteristics the availability of profitable investment opportunities and cost of capital[2]. There is no managerial

[1] For a comprehensive overview of various investment theories see e.g. Chirinko, 1993.

[2] As Merton Miller wrote: "We opted for a Fisherian rather than the standard Marshallian representation of the firm. Irving Fisher's view of the firm – now the standard one in finance, but then just

discretion and corporate governance issues, because managers have net present value maximization behaviour. Capital markets are perfect and there are no transaction and information costs. Various critical views were expressed concerning the neoclassical investment modelling. In this study, we extend to the post-communist reality two of them. The first usual criticism on the neoclassical theory is based on the lack of empirical evidence supporting the theoretical assumption that internal cash flows are irrelevant for investment decisions. Many studies find out a positive link between internally generated cash flows and company capital investment[3]. A number of theories have been put forward to explain investment dependence on corporate liquidity, e.g. asymmetric information (Myers and Majluf, 1984; Fazzari et al., 1988 for the first empirical test) and managerial discretion theory (Grabowski and Mueller, 1972)[4]. Both of these theories treat current cash flow as a proxy for financial constraints. Financial constraint is defined as the wedge between internal and external costs of finance[5]. However, recent studies show that cash flow may not reflect the importance of internal funds for investment projects but could indicate future higher profitability of future sales and investment opportunities of firms in general (Chirinko and Schaller, 1995; Kaplan and Zingales, 1997; 2001). Thus, cash flow could reflect both financial constraint and expectations for firm' investment opportunities. Estimating q-models face similar problems. Studies show that average q is not only forward-looking variable but it also captures some or all company financial constraints (Chirinko, 1993). On the other hand, Tobin's q reflects future expectations if only firm is a price taker in competitive markets, there are constant returns to scale and the stock market value correctly measures the fundamental expected present value of the firm's future net cash flows (Hayashi, 1982). Another kind of criticism is based on the problems to measure replacement costs of assets due to the lack of disclosure requirements in most European countries (Goergen and Renneboog, 2001).

These problems aside**,** the paper addresses the ambiguity of investment-cash flow coefficients by exploring additional data on firm, its ownership and control structure and suggesting assumptions of the owners investment preferences. For example, one cannot argue that a positive cash flow coefficient of state-owned firms is a proxy for better investment opportunities. According to corporate governance literature, this is rather indicator of managerial discretion. Recently a second strand of the critical literature on the neoclassical investment models have emerged that examines the effects of corporate governance on investment performance[6]. The bulk of this literature studies mainly the Anglo-Saxon countries[7]. This literature focuses on corporate governance and legal system as determinants of investment performance. The firm is viewed as a large corporation with dispersed shareholders and separation of ownership and control (typical in the Anglo-Saxon countries) or as a company with concentrated ownership and conflict between controlling shareholder and minority shareholders (e.g. Continental European countries). Ownership concentration and identity of controlling owners determine firm's investment decisions. There are only a handful of papers that study corporate investment behaviour in countries in transition[8]. Most studies focus on the early transition. Few of these studied address the corporate governance determinants of investment in transition countries (e.g. Perotti and Gelfer (2001) for Russia; Durnev and Kim (2003) for an international comparative study; for a recent study on the investment performance of financial firms in CEE countries, see e.g. Mueller and Peev (2006).These studies provide some insights about the hypotheses presented below. Following the recent research focusing on cash flows as a determinant of investment, in this study we assume that the higher availability of internal cash flow is a proxy for lower financial constraints or lower cost of capital for managers. Hypotheses about investment performance by ownership categories are presented below.

Foreign investors

The previous studies reveal that the long-run company survival depends on the access to investable funds and innovation. In transition countries, a common view is that firms controlled by foreign investors have easier access to external finance and Western markets. Firm's managers prefer better disclosure of firms' information to potential external providers of capital. This decreases

becoming known – impounds the details of technology, production, and sales in a black box and focuses on the underlying net cash flows. The firm for Fisher was just an abstract engine transforming current consumable resources, obtained by issuing securities, into future consumable resources payable to the owners of securities" (Miller, 1988, pp. 103).

[3] For a survey of empirical studies, see Mueller, 2003, p.177-79.

[4] For recent studies applying asymmetric information and managerial discretion theories, see Gugler, Mueller and Yurtoglu (hereafter GMY), 2004a.

[5] Various proxies of financial constraints are used, like dividends payments (Fazzari *et al*. 1988); firm affiliation to business groups (Hoshi *et al*, 1991); age, ownership concentration, and membership in an interrelated group (Chirinko and Schaller, 1995).

[6] For dividend payments, see e.g. La Porta *et al* (2000b); Faccio, Lang and Young, 2001); for returns on investment (Mueller and Yurtoglu (2000); Goergen and Renneborg (2001); Gugler, Mueller and Yurtoglu (hereafter GMY), 2002).

[7] However, see e.g. GMY (2004b) for Anglo-Saxon countries and Continental Europe.

[8] See e.g. Lizal and Svejner (2002) for firms in the Czech Republic during the 1992-98 period; Budina, Garretsen and de Long (2000) for Bulgarian firms over the period 1993-95; Konings, Rizov and Vandenbussche (2002) for firms in Poland, the Czech Republic, Bulgaria and Romania during 1994-99; Peev (2004) for an overview.

information asymmetry between managers and capital markets. We may expect less severe asymmetric information problems in firms under foreign control compared to the domestic firms.

Research also reveals that foreign investors prefer establishing majority control to the privatised companies. The expectations are that foreigners can design more efficient governance structures constraining managerial discretion and will have long-term strategies for company development. Thus the potential problem of overinvestment may be reduced (Goergen and Renneboog, 2001). (1) The enhanced monitoring decreases managerial discretion on cash flows. (2)

The information asymmetry between management and large shareholders decreases as well due to low agency costs for large owners to evaluate investment projects proposals. The problem of underinvestment may be also reduced. (1) Better corporate governance structures attract external suppliers of capital. (2) Firm's managers prefer better disclosure of firms' information to potential external providers of capital. This decreases information asymmetry between managers and capital markets. Under these institutional conditions we may expect that cash flow is not liquidity constraint for firm's investment.

Hypothesis 1. In companies controlled by foreign firms, there is no relation between investment and internally generated funds.

Privatisation funds

Firms controlled by privatisation funds have ownership structures similar to corporate pyramids. Pyramid ownership structures consist of a chain of owners with an ultimate owner who has control over a firm through a control chain on each level. Literature reveals that the typical agency issues include expropriation of small shareholders through income shifting (Morck, Stangeland, and Yeung, 2000), tunnelling (Johnson et al., 2000), and large family shareholder entrenchment. Thus, we may expect a weak link between internally generated cash flows and investment due to the emerging pyramid ownership structures. On the other hand, privatisation funds may overcome the financial constraints of underdeveloped external equity markets establishing internal capital market for their subsidiaries. In both cases, we make *a priory* prediction about the greater financial reallocation in firms controlled by privatisation funds. Recent studies on Russia reveal even negative relationship between firm's internally generated cash flows and its investment in firms – members of financial-industrial groups (Perroti and Gelfer, 2001).

Hypothesis 2. In firms controlled by privatisation funds, there is no or a negative relation between investment and internally generated funds (financial reallocation hypothesis).

State-owned firms

After the collapse of planning system, state-owned firms faced daunting restructuring tasks to adjust to the new semi-market conditions. Studies on the early transition reveal severe soft budget constraint problems of investment decisions of state-owned firms[9]. We follow the previous literature and expect that the development of legal and financial system during transition has gradually increased the fiscal discipline and budget constraints for these firms. The managerial discretion theory may then predict positive investment-cash flow sensitivity for state-owned firms in the late transition period that we study in this paper.

Hypothesis 3. In state-owned companies, there is relation between investment and internally generated funds (hardening the budget constraint hypotheses).

Non-Financial Firms

In firms controlled by non-financial firms, predicting the effects of controlling owners on investment performance is difficult in both developed countries with strong corporate governance systems and countries with weak corporate governance[10]. Controlling managers may maximize profits. On the other hand, controlling managers may benefit only the parent company. The availability of external finance for these firms is usually not sufficient. The common assumption is that these firms are more financially constrained than both foreign investor' controlled companies and companies controlled by privatisation funds.

Hypothesis 4. In companies controlled by non-financial firms, there is relation between investment and internally generated funds.

B. Econometric Modeling

A recent overview of empirical studies applying different investment theories ranks the performance of four investment models (accelerator, neoclassical, q-model, and cash flow) and concludes that: "…On the marginal return side, quantity variables like output as implied by the accelerator theory seem to outperform both price variables and expectations variables like Tobin's q (Chirinko, 1993). On the cost of capital side, cash flow outperforms the various measures of the neoclassical cost of capital. The best equation for explaining investment at the firm level probably combines accelerator and cash flow variables." (Mueller, 2003, p. 179-180). We test the hypotheses presented above by estimating a simple investment accelerator-cash flow model, linking cash flow (a proxy for liquidity), sales

[9] For a survey, see Kornai *et al*(2003).
[10] See Gugler, Mueller and Yuttoglu, 2002.

growth or Tobin's q (proxies for investment opportunities) and ownership structures to investment. All of the independent variables are lagged one period to avoid their being partly endogenous. Financial variables are scaled by the firm's capital stock to eliminate size effects. The basic equation (Model I) is written as:

$$It / Kt\text{-}1 = a + b(CFt\text{-}1 / Kt\text{-}1) + c(\Delta St\text{-}1 / Kt\text{-}1) + \mu it \quad (1)$$

This equation is modified by substituting with Tobin's q as a proxy for firm's investment opportunities to the following specification (Model II):

$$It / Kt\text{-}1 = a + b(CFt\text{-}1 / Kt\text{-}1) + c(qt\text{-}1 + \mu it \quad (2)$$

where *I* is investment in property, plant and equipment measured by the change in the capital stock (proxied by tangible fixed assets – item 3, Amadeus data base, Formula of accounts and ratios) plus deprecation (item 42) during year t. *K* is the book value of capital stock measured by net fixed assets (tangible fixed assets minus deprecation) lagged one period.

CF is cash flow is measured by net profit after tax (item 39) plus deprecation (item 42), ΔS is the difference of average total annual sales (item 25) lagged one period. Tobin's q (*q*) is measured by the market value of common equity (share price at the end of the fiscal year times number of common shares outstanding) plus the book value of the total debt (the sum of total short-term debt (item 17) and total long-term debt (item 15) divided by total assets (item 10).

III. Description of Data and Ownership Categories

A. Data

This study explores data about listed companies in Bulgaria the Czech Republic over the period 1998-2003. The data are taken from the 2004-06 versions of the Amadeus data set. Additional data for the Bulgarian companies comes from a unique database on the largest Bulgarian firms listed on the Bulgarian Stock Exchange (BSE) collected in 2002 for the purposes of the CERGE-EI project "Corporate Governance, Currency Board and Corruption in Bulgaria". Our data set contains accounting data (balance sheet, income statement) and ownership and control structures information on 176 companies listed on the BSE and 58 companies listed on the Prague Stock Exchange (PSE). This is a fairly representative sample of active companies with listed stocks in these markets over the period studied. In Bulgaria about 1000 companies were privatised through mass (voucher) privatisation and transformed into listed companies in 1996-97. In the Czech Republic, approximately 1700 firms were privatised through mass privatisation in 1991-92.

However, in both countries the bulk of these companies left the stock exchange due to various factors (de-listing, mergers, change of legal status, liquidation and the like). The rest of the companies have preserved their status of public companies but a few were actively traded. In 2003, only around 30 companies were actively traded on the BSE. In the Czech Republic, only 27 of the most actively traded fifty companies had annual turnover more than 1 mn CZK (approximately 30 th EUR) in 2003. The total share of the seven most liquid companies amounted to 90 percent of the base market capitalisation on the PSE (PSE Fact Book, 2004).

The 1998-2003 period consists of late transition years for both Bulgaria and the Czech Republic. In the early transition period, both countries had experienced a second recession after the initial transitional decline in 1990-92. In the case of Bulgaria, there was a second sharp decline of GDP and financial crisis in 1996. In the Czech Republic, there was a recession from 1997 to 1999. In the Bulgarian case, after the collapse of the banking system in 1996, a special institution – a currency board was introduced in 1998.Corporate investment finance was hampered by both fragile equity markets and the passive lending behaviour of Bulgarian banks observed in 1998-2001. Domestic credit's share of GDP decreased dramatically from 115 percent in 1996 to 18 percent at the end of 2000. This kind of bank behaviour can be partly explained by the currency board arrangements. Under the currency board's constraints, the central bank cannot lend to the government, cannot refinance banks, and has no discretionary monetary policy.

Thus, we expect more severe financial constraints for the Bulgarian firms over the period studied. Table 1 presents data about the importance of the banking sector, stock market, and bond market in financing firms for the two countries. At the bottom part of the table, data on other transition economies are also reported for comparative purposes. All ratios are calculated for 2003. In the Czech Republic, the size of the banking sector (measured by the ratio of bank deposits to the GDP) is 58 percent, while in Bulgaria the corresponding number is 37 percent.

In the Czech Republic, stock market capitalisation is about four times larger than the size of the stock market in Bulgaria. These different developments of the financial sector suggest that on the supply side of finance, one may expect the *average* Bulgarian firm to be more constrained than its counterpart in the Czech Republic.

B. Ownership Categories

We need to identify the type of control measured by ownership concentration and the identity of the largest owners. There is a high degree of ownership concentration in both countries. Table 3 shows that in Bulgaria 64 % of public companies in the sample

have the largest shareholder owning a majority stakes of shares (over 50%) and 33 % of companies are under minority control (share of the largest shareholder between 20% and 50%). In the Czech sample, the ownership concentration is even higher, around 71 % of companies are under majority control and 25 % have minority control (Table 4). Tables 3 and 4 also describe the identity of the largest *direct* owners[11].In both samples, we can identify individuals, non-financial firms, financial firms, the state, and foreigners. In the Bulgarian sample, we also have observed specific largest owners like owners after manager-employee buy-outs schemes of privatisation (MEBO), privatisation funds as a typical largest owner after the mass privatisation scheme, and offshore companies. In Bulgaria, pprivatisation funds are the largest shareholders in 49 companies (28 % of our sample).

The second important largest shareholders are domestic non-financial firms (45 companies and 26 % of the sample). The third important largest owner is the state holding company Bulgartabak – in 22 companies (13 % of the sample) and the fourth important largest owners are foreign (non-offshore) companies – in 21 firms (12 % of our sample). In the Czech sample, the largest shareholders are foreign non-financial firms (41 % of the sample), domestic non-financial firms (25%), and domestic State Property Fund (23%). In both countries banks and individuals are not important largest owners. We will test hypotheses described in the Section 2 focusing on the most typical ownership categories in each country. The summary of hypotheses by the observed ownership identities is described in Table 4. Both the Bulgarian state-owned holding company Bulgartabak and the National Property Fund in the Czech Republic have double-sided ownership structure. The Czech company is privatisation fund and state-owned firm. The Bulgartabak is a holding company and state-owned firm. Thus, the predictions of both Hypotheses 2 and 3 imply for these firms. We study the relationship between ownership categories and investment patterns for a sample of 109 companies in Bulgaria and 49 firms in the Czech republic for which financial data are available. Summary statistics on the basic variables by ownership categories are presented in Table 5. In the Bulgarian sample, the largest companies are firms controlled by the state holding company. Firms under foreign control have the highest investment opportunities (Tobin's q) and leverage. In the Czech sample, the National Property Fund controls largest firms. Foreign investors register the highest rates of investment opportunities and leverage.

IV. Investment Patterns

A. Main Results

Table 6 reports the results for the investment/cash flow equation by ownership categories for Bulgaria. All specifications include 14 industry dummies and time dummies. The left-hand side of the table presents OLS estimates of the investment model using accelerator term (sales growth) as a proxy for investment opportunities (Model I). The accelerator term takes on the predicted positive sign for all ownership types. Contrary to the expectations, the coefficient on cash flow for foreigncontrolled firms is large, positive and significant. In this respect the results do not support Hypothesis 4. The cash flow-investment sensitivity is negative and significant for the firms controlled by the state-owned holding (Bulgartabak). This result shows a high degree of financial reallocation within the holding company. For both firms controlled by privatisation funds and other non-financial firms, the coefficient on cash flow is insignificant and positive. Table 6 also presents the estimated coefficients of the same investment model allowing for company fixed-effects (mid-side of table). Not surprisingly, the excluding the 14 industry dummy variables and including firm fixed effects over the studied period 1998-2003 increases the explanatory power of all the equations and we observe much higher R2s in the regressions. The individual coefficients are similar to those on the left side. Firms under control of foreign firms have positive and significant cash flow coefficient and seem to be again heavily cash constrained. Stateowned firms preserve their negative and significant coefficient and show the same financial reallocation investment pattern. The effects of the other ownership categories, privatisation finds and non-financial firms, remain statistically insignificant, although the sign of the coefficient of firms controlled by non-financial firms turns into negative. The left-side of table 6 presents OLS estimates of the investment model using Tobin's q as a proxy for investment opportunities (Model II). Lagged Tobin's q has the predictive positive sign only for foreign firms but it is insignificant. Surprisingly, for the other ownership categories, the coefficient on Tobin's q is negative and insignificant suggesting at least a weak link between investment and investment opportunities for these firms These results require additional robustness checks and some re-estimations are provided in Table 8 below. Again focusing on Table 6, the coefficient on cash flow for foreign firms remains large and significant (0.46). State-owned firms persistently show negative link between internally generated cash flows and company investment, although the coefficient is now

[11] However, one must mention an important caveat when measuring ownership concentration in both transition and developed countries. The usual estimates are based on the share of the *direct* largest shareholder, but the major unresolved issue is rather who are the actual *ultimate* owners, see e.g. Mueller, Dietl and Peev (2003) for Bulgaria.Our data sources did not allow us to determine the ultimate owners in most companies.

insignificant. The coefficient on cash flow for firms controlled by privatisation funds is positive and significant. On overall, the estimates for the Bulgarian listed firms reveal some surprising findings. Firms controlled by foreign firms rely more on their cash flows for investment decisions than the other ownership categories. Firms controlled by state-owned holding company show clearly financial re-allocation investment behaviour. The headquarters redistribute financial funds among subsidiaries playing the role of internal capital market. Whether this is an efficient substitute for external financing is a question that we address in Table 8. The estimates on cash flow coefficients for firms controlled by investment funds are positive but insignificant, except for the investment model with Tobin's q. For nonfinancial firms, all the results are insignificant. Table 7 shows the respective results for the investment/cash flow equation for the Czech Republic. For comparison purposes, estimates are grouped by the same econometric specifications and ownership category as in Table 6. Firms controlled by foreign investors show positive and significant cash flow-investment sensitivity in *all* three model specifications. The cash flow coefficient for these firms is small, it ranges between 0.05-0.07 that is much lower compared to their counterparts in Bulgaria. Firms controlled by State Property Fund have negative but insignificant cash flow coefficient in *all* the specifications. This investment pattern resembles the behaviour of the state-owned holding company Bulgartabak, although in the Czech case the negative link between company cash flows and investment is not so remarkable. Finally, companies controlled by domestic non-financial firms show ambiguous investment behaviour in the different specifications. Like in the Bulgarian sample, this is not surprisingly due to the heterogeneous character of this ownership category. Additional data is needed to identify the ultimate owners and suggest auxiliary assumptions about their invetment preferences.

B. Additional Robustness Checks

Tables 8-9 present additional robustness checks. The investment equations are estimated including ownership variables calculated as an interaction term between the cash flow and a dummy variable of the respective ownership category. Table 8 reports the results for Bulgaria. The sample is much larger than the sample of firms presented in Table 6, which helps to explain the lower R2s. The first column of table 8 shows OLS estimates using accelerator term as a proxy for investment opportunities.

The results are striking. The previous investment patterns of firms controlled by foreigners and a state holding company were confirmed. Contrary to the predictions of Hypothesis 1, the cash flow coefficient for foreign firms is again large, positive and significant at a one percent level. For state-owned firms, the coefficient is statistically significant and negative. The second column presents estimates after removing firm fixed-effects. The results remain similar for both foreign and state-owned firms. The estimates show also more definite patterns for firms controlled by privatisation funds. Their coefficient is positive and significant (0.25). However, firms controlled by other firms have negative cash flow-investment sensitivity. This result challenges our initial expectations that these firms are more financially constrained (Hypothesis 3). The third column of table 8 reports additional checks using Tobin's q. The results definitely corroborate the observed investment patterns of foreign firms and firms controlled by the stateowned holding company. The results also reveal that firms controlled by privatisation funds are cash constrained (0.37) and firms controlled by other firms are even more constrained (0.40). However, the lagged Tobin's q has a negative sign that challenges the theoretical background for including Tobin's q into the investment equation. To explain the separate effects of ownership categories for the lack of link between investment and investment opportunities, we construct interaction terms of Tobin's q and ownership dummies and estimate again the Model II. The fourth column of table 8 reports the results. The differences among ownership types are striking. Tobin's q has a positive and insignificant sign for firms controlled by foreign firms. The sign is negative and significant for both state-owned firms (-0.31) and firms controlled by privatisation funds (-0.04). For companies controlled by other firms, the coefficient is negative but insignificant. The findings show that investment opportunities (measured by Tobin's q) are more important for investment decisions of foreign firms suggesting profit-maximisation behaviour than for firms controlled by other firms.

Investment opportunities are even less relevant for the investment decisions of firms controlled by privatisation funds (negative coefficient), while for state-owned firms are not important at all. Further research is needed to test this observation Finally, Table 9 presents additional estimates for the Czech listed companies. The first two specifications (left-hand-side of table) show that the differences among the cash flow coefficients by ownership categories are not significant. The right-hand-side of Table 9 re-estimates the equations using Tobin's q as control variable. For both specifications, OLS and after removing firm fixedeffects, financial constraint problems are least severe in the sub-sample of companies controlled by foreign firms with possible access to sophisticated equity markets and well-developed banking sectors, and most severe in the sub-sample of domestic companies under control of other domestic firms (positive and significant coefficient). However, both coefficients are small, 0.02 for foreign investors and 0.04 for domestic firms. Firms controlled by the National Property Fund show again a negative link between actual

investment and investment opportunities, but the coefficient is like in the previous estimates insignificant. These re-estimates confirm the observed investment patters of listed firms in the Czech Republic. The sub-sample of foreign firms has slightly higher investment cash flow-investment sensitivity than other firms, but the cash coefficient is modest in magnitude. Foreign firms also have a positive link between actual investment and investment opportunities that indicates profit-maximization behaviour in accordance with the predictions of the investment model. The firms controlled by privatisation funds persistently show negative and also insignificant cash flow-investment sensitivity in *all* the specifications. The results imply that these firms are more involved in financial re-allocation investment patterns than the other listed firms on the Prague Stock Exchange, but their cash flow coefficient is both statistically and economically insignificant.

V. Discussion

The observed ownership structures of listed companies after mass privatisation in both Bulgaria and the Czech Republic are partly result of the chosen privatisation strategies in each country. For example, the Bulgarian governments have not been able to privatise Bulgartabak holding due to political considerations to preserve the rate of employment in regions with the Muslim minorities.

In the case of the Czech Republic, the state has decided to preserve control on the natural monopolies in the energy sector establishing a state-owned privatisation fund (National Property Fund). Reasonable hypothesis is also that foreign companies acquire firms with attractive investment opportunities. This endogeneity of ownership identity will affect any interpretation of the effects of ownership categories on investment behaviour. In this study, we have no appropriate instrument to control for these obvious endogeneity problems. Thus, we find out different investment patterns correlated with ownership types, but further research is needed to examine the causal relationship with more details.

One of the puzzling findings in this study is the sharp difference between two countries concerning investment performance of companies controlled by foreign firms. In Bulgaria, these companies show surprisingly high degree of investment-cash flow sensitivity (around 0.46) and the highest investment rates (0.17), while in the Czech Republic their counterparts have moderate cash flow- investment sensitivity (around 0.05) and also the highest investment rate in the country (0.09). Several plausible explanations of these findings may be discussed. First, over the period studied, important institutional difference between the two countries is the currency board introduced in Bulgaria in 1998 that led to a sharp decline of bank lending in this country in 1998-2001(Nenovsky, Peev and Yalamov, 2004).

However, the usual expectations about foreign firms are that they have easier access to international capital markets that could have overcome the local financial constraints in Bulgaria. Second, Bulgarian companies under foreign control are smaller than their Czech counterparts. They are medium-sized profitable growing firms with both highest Tobin's q and leverage rates among other ownership categories. They are relatively financially constrained but have better access to bank loans even under the currency board conditions than the other firms. On the other hand, most Czech firms are large and subsidiaries of big foreign conglomerates.

Their investment patterns resemble the investment behaviour of profit-centers of large conglomerates in Western Europe. Last but not least, in Bulgaria the foreign owners themselves are usually mediumsized firms, while in the Czech Republic most foreign investors belong to the family of the worldknown largest companies and industrial groups (e.g. EON, Adria group, and the like). Perhaps, this is a crucial difference usually hidden under the general category "foreign firms".

We observe also striking difference between investment patterns of firms controlled by privatisation funds. The Bulgarian firms are financially constrained (their average cash flow coefficient ranges between 0.16 and 0.37) and show inertial investment behaviour with the lowest investment rate (0.04) among ownership categories in Bulgaria. On the other hand, firms controlled by the National Property Fund in the Czech Republic have nearly zero investment-cash flow sensitivity and show investment pattern of small financial re-allocation. First, we observe essential differences of firm characteristics of these firms based partly on the different mass privatisation strategies in the two countries. In Bulgaria, privatisation funds acquired medium-sized enterprises that are much smaller than the firms controlled by the National Property Fund in the Czech Republic, most of which are in the energy sector. Second, in both countries firms controlled by privatisation funds have the lowest Tobin's q and leverage rates. However, in the Czech Republic these large firms use the internally generated cash flows for their investment activities.

This investment pattern is similar to the investment behaviour of matured large corporations in the United States with limited investment opportunities and ample cash flows. Managers prefer cash flow at a low cost to external financing. In the Bulgarian sample, firms controlled by privatisation funds have less cash flow, less leverage and are more financially constrained. Companies controlled by non-financial firms have ambiguous investment behaviour. In models with Tobin's q as a proxy for investment opportunities, these firms are financially constrained in both countries. This corroborates Hypothesis 3. In the Czech Republic, the firms are

smaller than their Bulgarian counterparts and have the largest Tobin's q and leverage rates among all the ownership categories in the country. These growing firms are profitable and their access to external debt finance makes their investment pattern similar to the pattern of firms under foreign control in Bulgaria.

Finally, in the Bulgarian sample of listed companies, firms controlled by the state-owned holding "Bulgartabak" show economically and statistically significant financial re-allocation of capital. This investment pattern is unique for the sample of Bulgarian firms. Similar behaviour is documented in studies on firms affiliated to Russian business groups (Perrotti and Gelfer, 2001).

An important avenue for further research is to separate the effects on investment performance of corporate governance and holding organizational structures in firms affiliated to large organizations in post-communist transition.

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Appendices

Table 1. Size of Capital Markets

Country	Bank deposits to GDP	Stock market capitalization to GDP	Private bond market cap. to GDP	Public bond market cap. to GDP
Bulgaria	0.3702	0.0445		
Czech Republic	0.5785	0.2114	0.0412	0.2234
Croatia	0.3819	0.1493		
Estonia	0.2304	0.2937		
Hungary	0.375	0.1657	0.0149	0.2651
Latvia	0.1829	0.0627		
Lithuania	0.158	0.124		
Poland	0.2876	0.0999	0	0.2819
Romania	0.1907	0.0384		
Slovak Republic	0.5359	0.062	0	0.1198
Slovenia	0.3634	0.1217		
CEE-Total	**0.3293**	**0.122**	**0.014**	**0.2225**
United States	0.5602	107.91	0.9049	0.5135

Source. IMF IFS. Data are for 2003.

Table 2. Companies by Ownership Identity and Share of the Largest Owner: Bulgaria

Type of Owner/ Ownership Share	0 –9.99	10–19.99	20–49.99	50–74.99	75–100	Companies (total number)	Companies (%)
1. Domestic (not state)						119	
Individuals		1				1	
Non-financial firm			19	14	12	45	**26**
Financial firm (non-bank)			2	6		8	
Bank						0	
MEBO			5	9	2	16	
Privatisation Fund		1	19	18	11	49	**28**
2. Foreign (non-offshore)						21	**12**
Individuals			1		1	2	
Non-financial firm			4	4	6	14	
Financial firm (non-bank)						0	
Bank						0	
Holding company				2	3	5	
3.Offshore		1	5	3	4	13	
4.State holding company			3	1	18	22	**13**
Companies (total number)		3	58	57	57	175	
Companies (%)	**1**	**2**	**33**	**32**	**32**	100	

Source: Mueller, Dietl, Peev, 2003; Amadeus database

Table 3. Companies by Ownership Identity and Share of the Largest Owner: The Czech Republic

Type of Owner/ Ownership Share	0 –9.99	10–19.99	20–49.99	50–74.99	75–100	Companies (total number)	Companies (%)
1. Domestic (not state)						27	
Individuals							
Non-financial firm		1	2	6	3	12	**24**
Financial firm (non-bank)				1		1	
Bank			1			1	
MEBO							
National Property Fund			6	6	1	15	**28**
2. Foreign (non-offshore)						21	**40**
Individuals							
Non-financial firm		1	3	9	6	19	
Financial firm (non-bank)					1	1	
Bank			1			1	
Holding company							
3.Offshore							
4.State					3	3	**6**
Companies (total number)		2	13	22	14	53	
Companies (%)	**0**	**4**	**25**	**44**	**27**	100	

Source: Amadeus database.

Table 4. Predicted Signs of Cash flow-Investment Coefficients from Different Hypotheses

Cash flow-investment hypotheses		**H1**	**H2**	**H3**	**H4**
Ownership Categories:					
Bulgaria	**Czech Republic**				
Foreign	Foreign	0			
Privatisation fund			0, -		
State holding company	National Property Fund		0, -	+	
Non-financial firm	Non-financial firm				+

Note: The controlling owner is defined as the largest shareholder holding 20 percent or more of the shares outstanding. Foreign are firms controlled by foreign firm. Privatisation fund are firms controlled by privatisation fund. State holding company are firms controlled by the state-owned holding Bulgartabak. National Property Fund are firms controlled by National Property Fund. Non-financial firm are fims controlled by domestic non-financial firms. *Hypothesis 1.* In companies controlled by foreign firms, there is no relation between investment and internally generated funds. *Hypothesis 2.* In firms controlled by privatisation funds, there is no or a negative relation between investment and internally generated funds (financial reallocation hypothesis). *Hypothesis 3.* In state-owned companies, there is relation between investment and internally generated funds (hardening the budget constraint hypotheses). *Hypothesis 4.* In companies controlled by non-financial firms, there is relation between investment and internally generated funds.

Table 5. Summary Statistics by Ownership Categories

	Nobs	Mean (assets)	Med (assets)	Mean (tq)	Med (tq)	Mean (CF/K)	Med (CF/K)	Mean (lev)	Med (lev)	Mean (IK)	Med (IK)
Bulgaria											
Foreign	82	16.103	7.974	0.653	0.561	0.051	0.068	0.295	0.239	0.170	0.028
Privatisation fund	260	13.408	7.955	0.463	0.198	0.103	0.070	0.138	0.048	0.064	-0.017
Non-financial firm	227	64.716	15.041	0.301	0.250	0.124	0.069	0.167	0.110	0.145	0.020
State holding company	109	39.968	25.529	0.302	0.143	0.074	0.012	0.162	0.070	0.091	-0.020
Czech Republic											
Foreign	109	9981.550	6607.202	1.791	1.444	1.376	0.718	1.060	0.818	0.087	0.105
National Property Fund	90	34456.393	12784.577	1.010	0.884	0.726	0.431	0.595	0.478	0.075	0.086
Non-financial firm	84	3186.136	2321.535	3.181	2.847	2.088	1.207	1.919	1.627	0.009	0.061

Note: Assets are total assets in local currency in million BGN and CZK. Tq is Tobin's q. CF/K is cash flow scaled by the firm's capital stock. Leverage is debt/total assets ratio. IK is investment ratio, where I is investment in property, plant and equipment measured by the change in the capital stock plus deprecation and K is the book value of capital stock measured by net fixed assets. All variables are presented with their mean and median values.

Table 6. Ownership and Investment in Bulgaria: Dependent Variable It / Kt-1

	Model I: OLS				**Model I: Fixed effects**				**Model II: OLS**			
	Foreign	**Privatisation fund**	**Non finan firm**	**State**	**Foreign**	**Privatisation fund**	**Non finan firm**	**State**	**Foreign**	**Privatisation fund**	**Non finan firm**	**State**
CF/K	0.488	0.164	0.297	-0.183	0.488	0.189	-0.303	-0.25	0.465	0.322	0.328	-0.012
t-value	2.71	1.33	1.49	-2.23	2.59	1.63	-1.47	-2.41	1.93	2.16	1.43	-0.22
S/K	0.026	0.035	0.021	0.123	0.039	0.112	0.036	0.18				
t-value	1.04	2.3	1.21	3.13	1.54	4.19	0.94	2.83				
Tobin's q									0.02	-0.013	-0.259	-0.174
t-value									0.24	-1.08	-1.67	-1.27
Cons	-0.178	-0.158	-0.078	-0.067	-0.054	-0.216	-0.034	-0.208	0.061		0.284	-0.245
t-value	-1.41	-3.33	-0.7	-9.06	-0.34	-3.43	-0.38	-1.79	0.34		1.96	-1.27
Nobs	62	177	172	81	62	177	172	81	29	106	95	43
Rsq	0.32	0.31	0.23	0.39	0.40	0.46	0.4	0.48	0.46	0.41	0.23	0.39

Note: CF/K is cash flow divided by the firm's capital stock. S/K is the difference of average total annual sales divided by the firm's capital stock. All OLS specifications include industry and dummy variables.

Table 7. Ownership and Investment in The Czech Republic: Dependent Variable It / Kt-1

	Model I : OLS			Model I: Fixed effects			Model II: OLS		
	Foreign	Privatisation fund	Non finan firm	Foreign	Privatisation fund	Non finan firm	Foreign	Privatisation fund	Non finan firm
CF/K	0.070	-0.006	-0.023	0.073	0.001	0.001	0.052	-0.007	0.032
t-value	4.06	-0.18	-1.88	6.98	-0.02	-0.01	1.93	-0.90	1.41
S/K	0.105	0.255	0.214	0.127	0.359	0.276			
t-value	4.27	1.98	4.90	5.31	5.29	5.64			
Tobin's q							-0.020	0.071	0.013
t-value							-1.170	2.490	0.690
Cons	-0.247	-2.157	-0.609	-0.340	-0.310	-0.279	-0.385	-0.367	-0.054
t-value	-2.72	-3.22	-5.35	-6.19	-2.78	-2.90	-1.63	-2.14	-0.38
Nobs	85	70	67	85	70	67	53	61	34
Rsq	0.77	0.50	0.56	0.75	0.56	0.69	0.67	0.60	0.40

Note: CF/K is cash flow divided by the firm's capital stock. S/K is the difference of average total annual sales divided by the firm's capital stock. All OLS specifications include industry and dummy variables.

Table 8. Pooled Sample: Dependent Variable It / Kt-1 (Bulgaria)

	Model I: OLS	Model I: Fixed effects	Model II: OLS	
Foreign*CF/K	0.517	0.532	0.483	0.456
t-value	2.64	3.67	1.78	1.68
Privatisation fund*CF/K	0.163	0.250	0.371	0.367
t-value	1.26	1.65	2.45	2.41
Nonfinancial firm*CF/K	0.280	-0.363	0.401	0.409
t-value	1.66	-2.19	2.10	2.06
State*CF/K	-0.131	-0.108	-0.107	-0.050
t-value	-1.67	-1.66	-1.58	-0.81
scap	0.040	0.063		
t-value	3.96	4.53		
Tobin's q			-0.031	
t-value			-2.23	
Foreign*Tobin'sq				0.015
t-value				0.42
Privatisation fund*Tobin'sq				-0.042
t-value				-4.19
Nonfin. firm*Tobin'sq				-0.115
t-value				-1.31
State*Tobin'sq				-0.308
t-value				-2.16
Const.	-0.057	-0.085	-0.054	-0.058
t-value	-1.06	-2.13	-0.64	-0.72
Nobs	634	634	353	353
Rsq	0.18	0.39	0.18	0.20

Note: CF/K is cash flow divided by the firm's capital stock. S/K is the difference of average total annual sales divided by the firm's capital stock. All OLS specifications include industry and dummy variables.

Table 9. Pooled Sample: Dependent Variable It / Kt-1 (the Czech Republic)

	Model I: OLS	Model I: Fixed effects	Model II: OLS	Model II: Fixed effects
CF/K	0.022	0.017	0.020	0.022
t-value	0.92	0.70	0.62	0.56
Privatisation fund*CF/K	-0.017	-0.007	-0.008	-0.004
t-value	-0.65	-0.30	-0.76	-0.31
Nonfinancial firm*CF/K	-0.006	0.013	0.030	0.044
t-value	-0.54	0.75	2.01	3.09
scap	0.153	0.284		
t-value	3.54	8.91		
Tobin's q			0.007	-0.003
t-value			0.64	-0.19
Const	-0.036	-0.339	-0.017	0.05
t-value	-0.16	-5.34	-0.24	1.00
Nobs	260	260	169	169
Rsq	0.29	0.34	0.28	0.46

Note: CF/K is cash flow divided by the firm's capital stock. S/K is the difference of average total annual sales divided by the firm's capital stock. All OLS specifications include industry and dummy variables.