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Ownership Structures and Investment Performance in Central and Eastern Europe

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Abstract

This paper has three major goals: (i) to measure the returns on company investment across Central and Eastern Europe (CEE) and compare them with companies in EU countries (EU-15); (ii) to compare ownership structures of public firms in CEE and EU countries and measure investment performance by ownership groups in CEE countries; and (iii) to study under- and over-investment problems in CEE countries focusing on cash flow-investment sensitivity at the firm level. We present the asymmetric information and managerial discretion hypotheses as counterparts to the “credit crunch” and “soft budget constraint” hypotheses in the CEE region. We found the investment performance (marginal q) of the average public non-financial firm in CEE is fairly similar to the corresponding estimates for countries with Germanic and Scandinavian legal systems. Ownership concentration of non-financial public firms in CEE countries is slightly higher than in the group of Continental European countries. **The estimates suggest that banks as owners play a more effective role in decreasing agency problems than non-bank financial institutions (mutual funds, etc.).** Companies under control by a foreign owner have relatively better investment performance, but their returns on investment are still less than their cost of capital. The estimates do not corroborate the more pessimistic expectations about the investment performance of the state and other “transitional” owners and suggest a hardening of budget constraints for these ownership categories. The results also suggest that asymmetric information problems, although possibly present in the CEE countries, are much less severe than are agency problems, at least for our sample of fairly large, public companies.

Introduction

In Eastern Europe, the modernisation of privatised firms (former state socialist enterprises) and the growth of newly established private firms depend on efficient investment policies.¹ Two potential problems that these firms face may be outlined, namely: underinvestment due to financial constraints (lack of sufficient internal cash flow and access to external finance) and overinvestment due to soft budget constraints (easy access to external funds provided by government, banks and other institutions, and large cash flows). A soft budget constraint situation exists “if there is a recurrent practice of rescuing firms... Then managers will expect a rescue if losses are made, and this expectation will shape their behaviour” (Kornai, 2001, p. 1574).² The major issue is how to separate these different types of investment behaviour in the transitional context.

In early transition years, some empirical studies revealed that investment rates were high in the newly established private firms and low in the state-owned enterprises.³ The initial transitional recession and the decline of industrial output were explained by the hardening of the credit constraints (“credit crunch hypothesis”). According to this view, there was a positive link between financial constraints and aggregate investment and output.⁴ An alternative view on company investment policy in transition countries focuses on the existence of soft budget constraints in large firms (“soft budget constraint hypothesis”). Some authors claim that “larger firms had virtually unlimited access to capital”.⁵

Only a few studies have addressed the issues of corporate governance and ownership determinants of investment in transition countries.⁶ The first contribution of this paper is to study the effects of *country* corporate governance and *company* ownership structures on investment performance in CEE countries. The second contribution is to apply a unified framework for studying the effects of both *company* financial constraints and excess cash flow on investment performance in the transitional context. We present the asymmetric information (Stiglitz and Weiss, 1981; Myers and Majluf, 1984) and managerial discretion hypotheses (Grabowski and

¹ There is a handful of papers on investment behaviour in transition economies (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).

² For the concept of soft budget constraint, see also Maskin and Hu (1999).

³ See e.g. Belka et al. (1994) for Poland. This study was based on a questionnaire survey of state-owned, privatized and newly established private firms in 1993.

⁴ Calvo and Coricelli (1994).

⁵ See e.g. Lisal and Svejnar (2002) for the Czech Republic. This study explored data provided by the Czech Statistical Office over the period 1992-1998.

Mueller, 1972) as counterparts to the “credit crunch” and “soft budget constraint” hypotheses. To test the asymmetric information (AI) and managerial discretion (MD) hypotheses, we employ an estimate of marginal q first introduced by Mueller and Reardon (1993) to measure firm performance, and the methodology used by Gugler, Mueller and Yurtoglu (hereafter GMY, 2004b) to separate firms into the two groups likely to fit the two hypotheses, and test the sensitivity of investment to cash flow in the two samples.

Thus, this paper has three major goals: (i) to measure the returns on company investment across Central and Eastern Europe and compare them with companies in EU countries (EU-15); (ii) to compare ownership structures of public firms in CEE and EU countries and measure investment performance by ownership groups in CEE countries; and (iii) to study under- and overinvestment problems in CEE countries focusing on cash flow-investment sensitivity at the firm level.

In the next section, we discuss the main hypotheses of the study. Section III presents the methodology employed for estimating returns on investment. The data used to test the hypotheses are described in section IV. The empirical results are presented in section V and conclusions are drawn in the last section.

II. Hypotheses

A. Country Institutional Environment and Returns on Investment

The key institutional differences between firms in CEE and EU-15 countries are: (1) a large-scale fast change of the legal and financial environment (development of the legal system, private banking sector, stock exchanges and so on) in all CEE countries and convergence on EU structures in most advanced transition economies; (2) fast ownership changes and the emergence of both private owners known in Western economies and specific transitional owners.

However, in the typical neoclassical investment models, the *institutional* environment is treated as given and constant over time. The firm is viewed as a black box with only two characteristics: the availability of profitable investment opportunities and the cost of capital.⁷ The

⁶ See e.g. Perotti and Gelfer (2001) for Russia; Durnev and Kim (2003) for an international comparative study.

⁷ [As Merton Miller wrote about the Modigliani-Miller approach to the firm: “ 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 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” \(Miller, 1988, pp. 103\).](#)

neoclassical approach to investment postulates that managers maximize the net present value of investment (there are no managerial discretion and corporate governance issues). Capital markets are perfect, and property-rights and shareholder rights are well defined and protected.

The AI and MD theories relax some of the institutional assumptions of the neoclassical model of the firm. The AI theory relaxes the efficient capital market assumption. Managers are assumed to possess information about the returns on a company's assets and investment that the capital market does not possess. Internal funds are an important source of finance for investment, because they ease the cash constraints facing a firm.

Under the MD theory, managers have the discretion to pursue their own goals and seek to maximize the growth of the firm. In large, mature companies, investment opportunities are limited and managers must invest beyond the point where the value of the firm's shares is maximized to achieve the desired rate of growth. Internal cash flows are the preferred source of finance, because they allow managers to finance investment and avoid the discipline of the external capital market.

Some recent studies have examined the effects of corporate governance on investment performance in Western countries (for dividend payments, see La Porta *et al* (2000); Faccio, Lang and Young, 2001); for returns on investment (Mueller and Yurtoglu (2000); Goergen and Renneborg (2001); Gugler, Mueller and Yurtoglu (2004a). The bulk of this literature studies the Anglo-Saxon countries.⁸ It focuses on corporate governance and legal systems as determinants of investment performance. (1) The firm is viewed as a large corporation with dispersed shareholders and a separation of ownership and control (typical in the Anglo-Saxon countries) or as a company with concentrated ownership and a conflict between a controlling shareholder and minority shareholders (as in Continental European countries). (2) Ownership concentration, the identity of controlling owners, and corporate governance mechanisms for aligning interests of owners and managers determine a firm's investment decisions. (3) The legal system, size of external capital markets, and ownership concentration influence investment performance.

In Anglo-Saxon countries, the legal system offers better protection of minority shareholders from managerial exploitation and forces managers to reveal more information about their firms, e.g. their shareholdings, compensation, and the like (GMY, 2004b). This kind of information disclosure helps capital markets evaluate firms' investment opportunities and mitigate asymmetric information problems. On the other hand, the market for corporate control threatens incumbent managers with replacement, if their dividend policies diverge too far from the shareholders' interests and constrain managerial discretion over internal cash flows.

In Continental Europe, however, civil law legal systems lead to weaker protection of minority shareholders and more concentrated ownership. The disclosure of company information is more restricted. Capital markets and the market for corporate control are less efficient mechanisms for disciplining managers and, thus, they have more discretion to use their firm's cash flows.

In Eastern Europe, the institutional environment has three key characteristics. (1) All transition economies have a civil-law tradition as in Continental Europe. Candidates for EU membership have adopted civil-law type institutions to facilitate their adjustment to the EU legal environment. In many CEE countries, however, there still exists a gap between law development and law enforcement. The written laws are similar to or even better than in the EU-15 countries, but law enforcement is rather inefficient.⁹ (2) Some studies show that despite major differences in privatisation policies, the striking outcome after more ten years of transition process is the emerging ownership concentration and convergence of financial and legal systems in CEE countries (Berglof and Bolton, 2002). Ownership structures of non-financial firms measured by the share of the largest owner have become fairly concentrated. The major corporate governance conflict is between the controlling shareholder and minority shareholders (Berglof and Pajuste, 2003). (3) Bank-based financial systems have emerged with foreign-owned commercial banks prevailing. Most stock exchanges are very illiquid and only a small number of firms are actively traded. The number of firms listed on local stock exchanges after mass privatization has steadily decreased and market capitalization is very low. This has occurred despite both the global tendency toward corporate governance convergence on the Anglo-American system, and efforts in the 1990s to develop the capital market in CEE countries. In sum, the civil law legal system, more fragile capital markets and emerging concentrated ownership in Eastern Europe lead to country corporate governance systems with weak protection of shareholders rights. In these corporate governance systems, managers usually have high discretion over cash flows; they pay out less in dividends and pursue growth strategies investing in unprofitable projects.

Hypothesis 1: In CEE countries, the average firm has poorer investment performance measured by its returns on investment relative to its cost of capital than the average firm in both Western Europe and Anglo-American countries.

The profitability of investment opportunities varies both across countries and within them. Even in countries with weak protection of property and shareholders rights, some firms

⁸ However, see e.g. GMY (2004b) for Anglo-Saxon countries and Continental Europe.

⁹ See e.g. Pistor, 2000.

have high returns on investment, and may have difficulties financing their investment because of AI problems.

Hypothesis 2: In CEE countries, for firms with attractive investment opportunities, the returns on investment are greater than the firms' costs of capital.

B. Company Ownership Structures and Returns on Investment

In CEE countries, the bulk of listed firms are privatised, former socialist state-owned firms. These are mature firms. One can identify various types of largest owners: (i) private, strategic investors possibly interested in the firm' long-term viability; (ii) foreign investors; (iii) domestic privatisation funds; (iv) domestic, non-financial firms controlled by company insiders; (v) interest groups; (vi) offshore owners, and (v) the state in firms before their privatisation.¹⁰

In developed countries, six types of owners of listed firms can be distinguished: an individual/family, a financial firm, a non-financial firm, the state, foreigners and, when no one has a controlling interest, dispersed ownership. Empirical studies have tested various hypotheses about the effects of ownership identity on investments. Some predict AI problems to be mitigated in firms controlled by financial institutions, non-financial firms and the state and more severe in family-controlled firms or those with dispersed ownership (Goergen and Renneboog, 2001; GMY 2004b). Studies of managerial ownership effects on performance reveal a positive wealth effect from managers owning shares (measured by the total value of shares), and a negative entrenchment effect from share ownership (measured by the fraction of the firm's outstanding shares held by managers (GMY, 2003). At low levels of insider ownership, increased insider ownership seems to align the interests of shareholders and managers, but at high levels results in managerial unaccountability due to entrenchment (Goergen and Renneboog, 2001). However, neither theoretical considerations nor the empirical evidence allow us to make more definite predictions about the company investment performance by ownership types in countries with weak corporate governance systems. Therefore, we discuss some conventional hypotheses about investment performance by owner identities in CEE countries.

Foreign investors

In CEE countries, a common view is that firms controlled by foreign investors have easier access to external finance and Western markets, and that they benefit from low-cost management know-how transfers from abroad. On the other hand, we cannot necessarily expect agency problems in firms under foreign control to be less severe than in domestically-controlled firms. Foreign firms are also susceptible to high managerial discretion and the crucial question

¹⁰ For a recent survey of empirical studies on ownership and performance in transition economies, see e.g. Djankov and Murrell, 2002.

concerns the differences in *degree* of their agency problems. Thus, we can expect less severe asymmetric information problems in firms under foreign control compared to the domestic firms, but cannot make any predictions about their agency problems without information about the ultimate owners of foreign firms. We test the conventional view:

Hypothesis 3. For firms under majority foreign control, investment performance is better than in firms under domestic control.

Financial institutions

Similar considerations can be presented for firms where dominant shareholders are financial institutions. The financial owners may mitigate the AI problems between managers and external capital markets, but they themselves may also suffer from agency problems. Furthermore, financial institutions are a rather heterogeneous group of investors (e.g. banks, mutual funds, insurance companies and so on). Thus, we test for any systematic difference in investment performance of firms controlled by financial institutions in general and by banks and non-bank financial owners in particular, but make no predictions.

The State

State-owned companies before their privatisation are a part of the emerging transitional ownership structures. After the collapse of planning, state-owned firms faced daunting restructuring tasks to adjust to the new semi-market conditions. Most state-owned firms were used to soft budget constraints. We shall test whether these firms preserve their inefficient investment behaviour even in late transition years. Alternatively, one might expect that the development of legal and financial systems during transition has gradually increased the fiscal discipline and budget constraints at least for state-owned firms in most advanced TE joining the EU. We shall test the conventional view:

Hypothesis 4. For firms under state control, investment performance is poorer than in firms under private control.

Other transitional owners

Domestic holding companies (ex-privatisation funds) have ownership structures similar to corporate pyramids. Pyramid structures consist of a chain of owners with an ultimate owner who has control over all firms in the chain. The 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. We expect a negative effect of holding companies on investment performance due to their pyramid ownership structures and financial re-distribution benefiting controlling shareholders- managers. On the other hand, holding companies may overcome the financial constraints of underdeveloped

external capital markets establishing an internal capital market for their subsidiaries. In both cases, we can make an a priori prediction about the *greater financial reallocation* in firms controlled by holding companies. Recent studies of financial-industrial groups in Russia even reveal a *negative* relationship between a firm's internally generated cash flows and its investment (Perroti and Gelfer, 2001).

In some CEE countries, domestic-controlled firms with formal headquarters in offshore zones have emerged. Anecdotal evidence suggests that companies with offshore owners have been involved in capital flight. We expect *re-distribution* activities to be prevalent in these firms.

Hypothesis 5. For firms controlled by “transitional owners”, investment performance is poorer.

C. Cash Flow Investment Sensitivity

Many studies have found a positive link between internally generated cash flows and investment.¹¹ A number of theories have been put forward to explain this relationship including the two tested here – the asymmetric information and managerial discretion theories.¹²

AI problems arise in firms with attractive investment opportunities and limited internal cash flows. The market underestimates these returns and consequently the firms' share prices are *currently* undervalued. It is not in the interest of the *current* shareholders that new equity be issued to finance investment, because they would suffer a capital loss. The investment can be financed to the benefit of current shareholders, only if the firm has sufficient cash flows.¹³

Hypothesis 6: In CEE countries, there is a positive relationship between a firm's investment and its internally generated funds due to asymmetric information for firms with marginal returns on investment greater than their cost of capital.

The MD theory applies to mature firms with *dispersed shareholders*.¹⁴ It rests on several assumptions. (1) Firms have low investment opportunities (potential investment projects with positive net present value) relative to their internal funds. (2) Managers pursue their own goals, not shareholder welfare, and managerial utility is closely related to the firm' size and growth. This leads managers to invest in projects with lower rates of return than their cost of capital, to a

¹¹ For a survey of empirical studies, see Mueller, 2003, p.177-79.

¹² [For the AI theory, see \(Myers and Majluf, 1984; Fazzari et al., 1988\), and for the MD theory \(Grabowski and Mueller, 1972\).](#)

¹³ [The AI theory rests on several additional and strong assumptions: \(i\) managers maximize the wealth of only the current shareholders; \(ii\) the firm cannot finance its investments projects by either issuing debt \(it is debt constrained\) or cutting dividends \(they already are zero\). See, Myers & Majluf \(1984\), and for additional references to the literature, Gugler, Mueller and Yurtoglu \(2004b\).](#)

¹⁴ For the managerial growth-maximization hypothesis, see Marris (1964); Mueller (1972). For the first empirical testing of [the MD](#) theory, see Grabowski and Mueller (1972).

fall in the firm's share price, and increases the danger from takeover and the replacement of managers. (4) To avoid being taken over, managers pay some dividends to keep the share price from falling too low. Thus, the AI and MD theories are essentially mirror images of one another. Under the AI theory, firms invest too little, have a return on investment that exceeds their cost of capital, and pay no dividends. Under the MD theory, firms invest too much, have a return on investment below their cost of capital, and pay dividends. Both theories, however, predict more investment with higher cash flows. Under the AI theory the cost of external capital is too high, because the firm's shares are undervalued. Under the MD theory the cost of external capital is too high, because the firm has low marginal returns on investment and must pay its full cost of capital if it enters the external capital market.

For mature firms with *concentrated ownership* (typical in CEE countries), the conflict over investment is between a controlling shareholder and the minority shareholders. (1) The wedge between control and cash-flow rights creates incentives for the controlling, *ultimate* shareholders to invest a larger than optimal fraction of cash flow. (2) Even without the wedge between control and cash-flow rights, large shareholders have incentives to pay out little in dividends, because dividends are paid pro rata and the large shareholder gets proportionally the same amount as minority shareholders (GMY, 2004b). Thus, we assume that the MD hypothesis applies to CEE countries:

Hypothesis 7: In CEE countries, there is a positive relationship between a firm's investment and its internally generated funds due to managerial discretion, and the marginal returns on investment are lower than the firm's cost of capital.

III. The Calculation of Marginal q

Asymmetric information theory treats current cash flow as a proxy for financial constraints. A financial constraint is defined as the wedge between internal and external costs of finance.¹⁵ Studies usually apply Tobin's q (defined as the ratio of market value of a firm to replacement costs of the firm's capital stock) to control for a firm's investment opportunities. However, Tobin's q reflects expected returns on investment only if firm is a price taker in competitive markets, there are constant returns to scale and the stock market value of the firm correctly measures the fundamental expected present value of the firm's future net cash flows (Hayashi, 1982). There are also problems to measure replacement costs of assets due to the lack

¹⁵ Various variables are used to identify firms that are possibly subject of asymmetric information problems, like size, level of dividends (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).

of disclosure requirements in most European countries (Goergen and Renneboog, 2001). Tobin's q reflects the average return on a firm's capital, but relevant for investment is the *marginal* return on capital. The methodology introduced by Mueller and Reardon (1993) and applied by GMY (2004a) addresses these issues. It uses estimates of marginal q to measure investment performance, and separates firms into two groups likely to fit either the AI or the MD theories. we now briefly describe the methodology for estimating marginal q .

Let I_t be a firm's investment in period t , CF_{t+j} the cash flow this investment generates in $t+j$, and i_t the firm's discount rate in t .¹⁶

$$PV_t = \sum_{j=1}^{\infty} \frac{CF_{t+j}}{(1+i_t)^j} \quad (1)$$

We can then take PV_t from (1) and the investment I_t that created it, and calculate the ratio of pseudo-permanent return r_t to i_t , a ratio that we call q_m

$$PV_t = \frac{I_t r_t}{i_t} = q_m I_t \quad (2)$$

If the firm had invested the same amount I_t in a project that produced a permanent return r_t , this project would have yielded the exact same present value as the one actually undertaken. The market value of the firm at the end of period t can be defined as

$$M_t = M_{t-1} + PV_t - \delta_t M_{t-1} + \mu_t \quad (3)$$

where δ_t is the depreciation rate for the firm's total capital as evaluated by the capital market, and μ_t is the market's error in evaluating M_t . Subtracting M_{t-1} from both sides of (3) and replacing PV_t with $q_m I_t$ yields

$$M_t - M_{t-1} = q_m I_t - \delta_t M_{t-1} + \mu_t \quad (4)$$

That q_m is a marginal q can easily be seen from (2) and (4) by contrasting it with (average) Tobin's q . Tobin's q is the market value of the firm divided by its capital stock and equals the ratio of the return on its total assets to its cost of capital.¹⁷ Thus, it is a measure of *average* return on capital. Marginal q equals the change in the market value of a firm divided by the change in its capital stock (investment) that caused it.

¹⁶ This methodology was developed by Mueller and Reardon (1993).

¹⁷ Let M be the market value of a firm, K its total assets, r_a the return on these assets, i its cost of capital, π profits, and q Tobin's q . Then $q = M/K$, $M = \pi/i$, and $\pi = r_a K$. Substituting first for π and then for M , we get $q = (r_a K/i)/K = r_a/i$.

Two key features of q_{mr} are worth noting. First, its use as a measure of performance obviates the need to calculate company costs of capital. Equations (2) and (4) define the *ratio* of a company's return on investment to its cost of capital, which is precisely the statistic needed to test hypotheses about agency problems. Second, the procedure for calculating q_{mr} allows for different degrees of risk across companies. The stock market will demand a greater future stream of cash flows from an investment of 100 before it raises the market value of a high risk company by 100, than it demands of a low risk company. The assumption of capital market efficiency implies that the error term in (4) has an expected value of zero, and thus that equation 3 can be used to estimate both $*_i$ and q_{mr} under the assumption that they are either constant across firms or over time, or both. Dividing both sides of (4) by M_{t-1} yields

$$\frac{M_t - M_{t-1}}{M_{t-1}} = -\delta + q_m \frac{I_t}{M_{t-1}} + \frac{\mu_1}{M_{t-1}} \quad (5)$$

Equation 5 is our basic equation for estimating returns on investment by both countries and ownership categories. Equations (4) and (5) incorporate the assumption that the market value of a firm at the end of year $t-1$ is the present discounted value of the expected profit stream from the assets in place at $t-1$. Changes in market value are due to changes in assets in place as a result of investment and depreciation. To calculate q_{mr} , one needs an estimate of the depreciation rate of a firm's total capital, δ , where the value of this capital is measured by the market value of the firm. The depreciation rate depends on the composition of tangible and intangible assets in total market value, and these will differ across industries. We assume that industry depreciation rates are constant over time, and use a variant of eq. (4) to estimate a separate δ .

To estimate (5) we need data on the market value of each firm and its investments. The market value of a firm at the end of year t , M_t , is defined as the market value of its outstanding shares at the end of year t plus the value of its outstanding debt. Since this number reflects the market's evaluation of the firm's total assets, we wish to use an equally comprehensive measure of investment. Accordingly we define investment as

$$I = \text{After tax profits} + \text{Depreciation} - \text{Dividends} + \Delta\text{Debt} + \Delta\text{Equity} + R\&D + ADV \quad (6)$$

where ΔDebt and ΔEquity are funds raised using new debt and equity issues.

IV. Data

The data are taken from the 2005 version of the Amadeus data set. Amadeus contains ownership, accounting and market data on 1464 non-financial public companies listed in Eastern

Europe. We also use the latest versions of Osiris and COMPUSTAT data sets as complimentary sources of financial data. Market data are also collected from local stock exchanges in CEE countries and from company web sites. In Eastern Europe, most public companies are not actively traded and the quality of information they provide is poor. After excluding companies for which investment and market values were not available for all of the period 1999-2003 and the obvious outliers in the data, the number of companies reduces to 151. These are the non-financial companies in CEE countries whose shares were most traded on local stock exchanges, had the highest degree of information disclosure to the general public, and were likely to be included in country stock exchange indexes in Eastern Europe. Thus, our sample is biased toward the “blue chips” in the region.

The key variables used in our investment models are defined as follows. The market value of the firm equals the market value of common equity (share price at the end of the fiscal year times common shares outstanding) plus the book value of total debt (the sum of total short and long term debt). An accurate estimate of the market value of debt requires knowledge not only of the associated coupon and maturity structure, but also of the credit quality of each component. Because such information is not available from standard data sources, we use the book values. Tobin’s q is defined as the ratio of the market value of a firm to its total assets. Cash flow is the sum of after tax profits and depreciation minus total dividends. Our measure for the capital stock is net fixed assets (tangible fixed assets net of accumulated depreciation of property, plant and equipment). All variables are deflated by the Consumer Price Index and are expressed in real 1999 U.S. dollars.

V. Company Investment Performance in Transition Economies

A. The Effects of Country Institutional Environment

Table 1 presents the results of estimating equation 5 by constraining all companies in a country to have the same return on investment relative to the cost of capital (q_m). We allow for individual industry depreciation rates defined by 2-digit NACE. The estimated returns on investment are 77 percent of company costs of capital in the pooled group of CEE countries. This is consistent with Hypothesis 1 that corporate governance and legal systems in CEE countries are too weak to provide protection of shareholders rights against managerial opportunism, and thus the marginal returns on investment of the average firm are less than its cost of capital. Among the countries in Central Europe, the worst performer was the Czech Republic with a q_m of 0.64, Hungary (0.75) was in between, and Poland had a q_m of 1.20. The highest returns on investment were for Slovenia ($q_m = 1.59$), Estonia (1.20) and Poland. However, there is no evidence that corporate governance systems in these countries are sufficiently stronger than in other CEE

countries. One possible explanation for these results is that Slovenia, Estonia and Poland had better investment opportunities over the period 1999-2003 than other European transition economies, and that Hypothesis 2 fits their data better.

The right side of *Table 1* presents estimates of q_m for Western European countries.¹⁸ There are some obvious difficulties in such a comparison. First, our sample includes mainly public companies *actively* traded on local stock exchanges in Eastern Europe, with most being included in the country stock indexes, while the GMY study includes virtually all public companies in Western Europe. Another possible bias is due to the different sample periods studied – 1993-2003 in our study and 1985-2000 in GMY's. These problems aside, the preliminary evidence suggests a convergence of investment performance between the new EU-members and EU-15 countries. Estimates of q_m for most transition countries are comparable to those for the Germanic (0.74) and Scandinavian legal systems (0.78). The *average* firm in Eastern Europe has an investment performance (q_m) lower than in the Anglo-Saxon countries with their strong shareholders rights' protection, but at the same time has a higher q_m than in EU countries with French origin legal systems (e.g. France, Greece, Italy, Portugal, Spain).

B. The Effects of Ownership Structures

The ownership structures of non-financial public companies in CEE and Western European countries are summarized in *Table 2*. Ownership concentration is high in most CEE countries with the median largest shareholder owning around 50 percent of outstanding shares. Countries with the lowest ownership concentration are Poland (largest median shareholding of 31.29 percent), Slovenia (36.75) and Hungary (39.95). After about 15 transition years and a number of policy actions to develop active capital markets of the Anglo-Saxon type, the emerging ownership structures in Eastern Europe are nevertheless converging on the model of concentrated ownership typical for countries like Austria (55.10 percent for the median largest shareholding), Germany (50.98), France (49.14), and Belgium (43.35). Ownership concentration of non-financial public firms in the pooled group of CEE countries (49.9) is slightly higher than in the Continental European countries (40.74), but is quite a bit higher than in Anglo-Saxon countries like Great Britain (11.99), Ireland (13.20), and the United States (14.43).

There are some well-known explanations for the high ownership concentration observed in countries with civil law systems. The key arguments are based on the predictions of the "law and finance" literature – in countries with weak shareholders rights protection large shareholdings become an essential corporate governance mechanism for monitoring managers, substituting the

¹⁸ Gugler, Mueller, and Yortuglu (2004a).

disciplining role of the large shareholder for that of the market for corporate control. This seems a plausible explanation for the degree of ownership concentration in the transition countries.¹⁹

Table 2 also describes the identity of the largest *direct* shareholders in CEE countries using a typical classification scheme for the key ownership categories in developed economies: individual/family, financial firm, non-financial firm, the state and dispersed ownership. We follow the approach applied in the studies of Western Europe and identify the controlling owner as the largest shareholder holding 20 percent or more of the outstanding shares. Firms controlled by a bank, mutual fund, pension fund, a domestic private (ex) privatisation fund, insurance company, or other financial institution are categorised as financial firm-controlled. In most CEE countries, non-financial firms are the prevailing largest shareholders. The second most important largest shareholders are the state (Czech Republic, Slovenia) and financial institutions (Slovak Republic, Estonia), while for Poland and Hungary the second most important ownership category is dispersed ownership (no shareholder holds as much as 20 percent of the outstanding shares). The emerging ownership categories of non-financial public companies in Eastern Europe are rather similar to the typical ownership identities in Western Continental Europe. In the pooled group of CEE countries, 46 percent of firms are controlled by non-financial firms, followed by firms controlled by financial institutions and companies with dispersed ownership (both with 15.4 percent), while for the Continental European countries the most important category of controlling shareholders is also non-financial firms (42 percent of firms), followed by firms with dispersed owners (21.9), and firms controlled by financial institutions (16.4).

In **Table 3** we focus on some ownership categories, which are more typical in post-communist countries than in Western Europe. One may argue that in countries with weak corporate governance systems and higher ownership concentration as in CEE, the 20 percent criterion for identification of the controlling party is too low. Therefore, we have also applied a 50 percent or more cut-off to identify the majority owner.²⁰ The left part of the **Table 3** presents the results. In the pooled sample of CEE countries, 48 percent of companies have a majority owner with a non-financial firm being the majority shareholder in around a quarter of the companies, and the state in about 15 percent. Foreign owners (foreign state, foreign financial institutions, foreign holding groups, foreign firms, and foreign individuals) are the largest

¹⁹ However, one must mention an important caveat when measuring ownership concentration in both EU-15 and CEE 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.

shareholders in 33 percent of the companies in our sample. Foreign majority participation is concentrated in Hungary (56 percent of majority owners), the Slovak Republic (33), the Czech Republic (32), and Poland (30).

Financial institutions are typically not majority owners in non-financial public companies in CEE (0.07 percent of firms). However, the real *participation* of financial institutions in ownership structures is underestimated using both the 20 and 50 percentage criterion to identify the controlling shareholder. In the right side of **Table 3**, we identify additional ownership categories focusing on the presence of financial owners in the ownership structures of public companies in CEE. Firms in which bank(s) only or bank(s) and other financial institutions held ownership stakes are classified as firms with bank owners. The similar criterion is applied for firms with non-bank owners. These are firms with non-bank financial institutions in their ownership structures. Finally, companies with financial owners are those with at least one financial institution owning their outstanding shares. Financial institutions hold ownership stakes in 58 percent of CEE non-financial public companies in our sample. Respectively, for banks this figure is 27 percent, while for the non-bank financials (mutual funds, insurance companies, etc.) it is 31 percent. This evidence suggests a massive participation of financial institutions in the ownership structures of non-financial public companies in Eastern Europe. It varies by country with the highest estimates for Estonia (90 percent of companies), Hungary (88), the Slovak Republic (83), and Poland (64). In the Czech Republic, the corresponding figure is a fairly moderate 24 percent.

We identify also a specific ownership category labelled “transitional owners”. It includes such diverse owners as the state, privatisation funds, domestic holding companies (some of them ex-privatisation funds), insiders (managers and employees), and offshore owners (owners registered in offshore zones). All of these ownership categories are specific for the post-communist transformation from state to market, and we expect them to have different investment behaviour. The “transitional owners” held ownership states in about 20 percent of the companies with a significant participation in Slovenia and the Czech Republic.

Table 4 presents estimates of returns on investment (q_m) by ownership categories. All ownership categories have returns on investment less than their costs of capital. This is a strong evidence for the importance of managerial discretion and weak corporate governance structures in CEE countries. However, significant differences exist in the magnitudes of over-investment by ownership groups. Hypothesis 3 states that foreign owners mitigate AI problems between company managers and external capital markets. This hypothesis was partly corroborated. A

²⁰ [This 50 percent criterion is typical in many studies of ownership structures in transition economies.](#)

company under control by a foreign owner has a *relatively* better investment performance than the other firms in our sample, but its returns on investment are still only 92 (0.73 + 0.19) percent of its cost of capital.

The overall effect of the financial owners on company investment performance is negative but statistically insignificant using a 20 percent cut-off (column 1), and significantly negative using a 50 percent cut-off (column 2). When we separate the financial institutions into banks and non-banks, however, the differences are striking (column 3). Banks have a positive and significant effect on returns on investment increasing q_m by 16 percent, while non-bank financial institutions (mutual funds, etc.) have an opposite effect. They decrease q_m by 20 percent and this difference from the overall average (0.77) is also statistically significant. The estimates suggest an effective role of banks in decreasing agency problems. The non-bank financial institutions do not seem to play this role, however.

The coefficients for both the state and “transitional” owners are positive but small and statistically insignificant. They do not corroborate the more pessimistic expectations of Hypotheses 4 and 5 about the inefficient behaviour of these owners. The estimates suggest the hardening of budget constraints for the state and a decrease in the opportunities for primitive accumulation of capital and redistribution of funds for the other transitional ownership categories.

C. Explaining Investment

The AI and MD theories both predict a relationship between cash flow and investment, although for different types of companies. Companies which fit the AI theory should have returns on investment higher than their cost of capital ($q_m > 1$), while companies fitting the MD theory should have returns on investment lower than their cost of capital ($q_m < 1$). Therefore, to test the AI and MD using an investment/cash flow regression equation, we have divided the sample of firms in CEE countries according to whether $q_m \geq 1$ or $q_m < 1$. The individual company q_m s were calculated in the following way. Using equation (2), we can calculate a weighted average qm with each year’s investment as weights

$$\bar{q}_m = \frac{\sum_{j=0}^n q_{m_{t+j}} I_{t+j}}{\sum_{j=0}^n I_{t+j}} = \frac{\sum_{j=0}^n PV_{t+j}}{\sum_{j=0}^n I_{t+j}} \quad (7)$$

Repeated substitution into equation (3) and rearranging yields the following equation

$$q_m = \frac{M_{t+n} - M_{t-1}}{\sum_{j=0}^n I_{t+j}} + \frac{\sum_{j=0}^n \delta D_{t+j} M_{t+j-1}}{\sum_{j=0}^n I_{t+j}} - \frac{\sum_{j=0}^n \mu_{t+j}}{\sum_{j=0}^n I_{t+j}} \quad (8)$$

Stock market efficiency implies $E(\mu_{t+j}) = 0$ for all j , and thus that the last term on the right in (8) becomes small relative to the other two terms as n grows large. The market values and investments of the firm are observable. Therefore, q_m can be calculated to a close approximation using (8) for any assumed set δD when n is large. We make these calculations using our estimates of depreciation rates (δD) from eq. (4). In our sample, we allow for 13 individual industry depreciation rates defined by 2- digit NACE.

Table 5 presents descriptive statistics of key variables for our sample of firms separated into two groups according to the q_m s over the period 1999-2003. Several important characteristics of the two groups of companies may be outlined. (1) Company size is similar for the two groups, with firms having $q_m > 1$ being slightly larger (measured by sales), and having assets twice as large, but with a large variance. In the latter case, the median is perhaps a better measure of central tendency. Using medians firms with returns less than their cost of capital ($q_m < 1$) have larger assets. (2) Companies investment opportunities (proxied by four variables) are different for the two sub-samples of firms. Firms with $q_m < 1$ have only slightly higher sales growth, while the rest of the sample has a slightly higher Tobin's q and price-earning ratio (PE). (3) There is a significant difference between the cash flows of the two groups of firms. Companies with $q_m < 1$ have larger cash flows as measured by four variables. This difference is consistent with both the AI and MD. Companies that overinvest ($q_m < 1$), have larger cash flows than companies, which appear to be cash-constrained and underinvest ($q_m > 1$). (4) The figures for dividend payouts are *inconsistent* with the AI, however. AI-firms should be cash-constrained and be paying no dividends. The dividend/cash flow ratio for firms with $q_m > 1$ is twice that of firms with $q_m < 1$, however. The differences in dividend payouts as well as in investment to assets ratios are consistent with the MD hypothesis. Companies with returns on investment less than their cost of capital payout less in dividends and invest relatively more than companies with $q_m > 1$. (5) Finally, firms with $q_m > 1$ are concentrated in the food and tobacco, chemicals, construction, and real estate industries (not indicated in **Table 5**).

We test the AI and MD theories by estimating an investment/cash flow model for each of the samples that should best fit the respective theory. Most studies, which estimate cash flow models, include Tobin's q to capture investment opportunities. As discussed above, we think that

Tobin's q is not an ideal measure of investment opportunities, because it also measures infra-marginal rents due to market power differences and the like. We thus include our estimates of marginal q to capture investment opportunities. Since we use marginal q to split the sample, its variance is reduced, which should weaken its explanatory power, but we still think it is a better measure of investment opportunities than Tobin's q .

Table 6 presents a correlation matrix for the variables used in our econometric modelling for the full sample of firms. **Table 7** reports the results for the investment/cash flow equation for the full sample, and the two sub-samples. Our interest is in the results for the two sub-samples.

The coefficients on cash flow are positive and significant in both samples and thus our results support both the AI and MD theories. The coefficient on cash flow is four times larger for the firms with $q_m < 1$, than it is for $q_m > 1$, however. Thus, the problem of overinvestment out of cash flows due to agency problems appears to be much more severe in the CEE countries than is the problem of underinvestment due to cash constraints.

The coefficient on marginal q is positive and statistically significant in the sub-sample with $q_m > 1$. Firms in this sub-sample appear to be neoclassical in that their returns on investment are not below their costs of capital, and quite plausibly would invest more if they have higher returns on investment. In contrast, the coefficient on q_m for firms with $q_m < 1$, is insignificant. The investment decisions of companies subject to agency problems are unrelated to their returns on investment.

As robustness checks, we substituted both company sales growth and Tobin's q for marginal q to capture investment opportunities. The coefficient on sales growth was again positive and significant for the $q_m > 1$ sub-sample, and again insignificant in the $q_m < 1$ sub-sample. The coefficients on Tobin's q were insignificant in both sub-samples confirming our misgivings about it as an index of investment opportunities.

VI. Discussion

Most studies on financial integration have focussed on the convergence of legal systems, capital markets and law enforcement between the EU-15 countries and CEE. In this paper, we found the investment performance (q_m) of the average public non-financial firm in CEE is fairly similar to the corresponding estimates for countries with Germanic and Scandinavian legal systems. The investment performance of CEE companies was better than that of the average firm in EU countries with French origin legal systems (e.g. France, Greece, Italy, Portugal, Spain), but worse than in the Anglo-Saxon countries. Thus, this paper provides evidence for a *functional* convergence of public non-financial companies in CEE countries to those in the West.

Our research supports previous studies of ownership structures in the CEE region. We show that ownership concentration of non-financial public firms in the pooled group of CEE countries is slightly higher than in the group of Continental European countries and much higher than in Anglo-Saxon countries like Great Britain, Ireland, or the United States. The ownership categories of non-financial public companies in Eastern Europe are similar to the ownership identities in Western Continental Europe. In the pooled group of CEE countries, 46 percent of the firms are controlled by non-financial firms, followed by firms controlled by financial institutions and companies with dispersed ownership, while for the Continental European countries the prevailing controlling shareholders are also non-financial firms (42 percent), followed by firms with dispersed owners and those controlled by financial institutions.

We paid special attention to the role of nonbank financial institutions and banks as shareholders in CEE and their effects on investment performance. We identified not only firms whose largest shareholders are financial institutions, but also the group of companies with *any* financial institution (bank, mutual fund, insurance company and so on) owning their outstanding shares. The overall effect of financial owners on investment performance is negative, however, companies with bank owners have higher returns on investment by 20 percent, while companies with nonbank financial institutions (mutual funds, etc.) as shareholders show opposite results. These estimates suggest an effective monitoring role of banks as *minority* shareholders in mitigating agency problems.

For the other ownership categories, companies under majority control by a foreign owner have *relatively* better investment performance than the average firm in our sample, but their returns on investment are still less than their cost of capital ($q_m = 0.92$). The estimates for the state and the other “transitional” owners do not corroborate the more pessimistic conventional views. The results suggest a hardening of budget constraints for the state and the other transitional owners over the late transition period (1999-2003).

We identified the key characteristics of firms with *overinvestment* in our sample. These are firms (i) with higher cash flows, (ii) which payout less dividends, (iii) are less leveraged, (iv) use more internal funds for investment, and (v) invest more. These features are consistent with the managerial discretion theory for firms in developed economies. The second group of companies with returns greater than their cost of capital ($q_m > 1$) and potential *underinvestment* have lower cash flows, and higher leverage as predicted by the asymmetric information theory, but they pay out much more dividends than the AI theory predicts. The much smaller coefficient on cash flow in the investment regressions, also suggest that AI problems, although possibly

present in the CEE countries, are much less severe than are agency problems, at least for our sample of fairly large, public companies.

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Table 1 Returns on investment (q_m) by country

The table presents the results of estimating eq. 5 by constraining all companies in a country to have the same return on investment relative to the cost of capital (q_m). We allow for individual depreciation rates defined by 2- digit NACE. The equation has an adjusted R^2 of 0.55. The number of observations is 426. All t-values are robust to heteroscedasticity (White, 1980).

Eastern Europe	\hat{q}_m	t-value	Obs.	Firms	Western Europe***	\hat{q}_m
Czech Republic	0.64	6.34	143	38	Austria	0.71
Hungary	0.75	5.89	59	16	Germany	0.57
Poland	1.20	5.22	94	36	France	0.57
Slovak Republic	0.81	4.35	24	8	Denmark	0.65
Slovenia	1.59	5.19	32	12	Finland	0.96
Estonia	1.25	1.13	18	10	Sweden	0.65
Latvia	0.66	13.44	24	8	Great Britain	0.85
Lithuania	0.64	3.06	11	4	Ireland	1.10
Bulgaria	0.72	4.81	30	10		
Romania	0.70	4.83	12	6		
Croatia	0.79	2.78	9	3		
Transition economies	0.77	10.44	456	151	Anglo-Saxon Legal System	1.02
CEE5 countries*	0.84	8.30	348	110	Scandinavian Legal System	0.78
Baltic states	0.64	10.47	53	22	German Legal System	0.74
Accession countries***	0.69	5.1	51	19	French Legal System	0.59

* The group of CEE countries includes Czech Republic, Hungary, Poland, Slovakia and Slovenia

** The group of Accession countries includes Bulgaria, Romania and Croatia.

*** The estimates for Western Europe are from GMY (2004, Table 2).

Table 2 Ownership Concentration and Identities in Eastern and Western Europe

Country	No. firms	Mean largest holder	St.dev. largest holder	Median largest holder	Family holdings	Financial holdings	Non-financial holdings	State holdings	Dispersed holdings
Czech Republic	38	63.55	22.04	54.2	0	0.105	0.553	0.316	0.026
Hungary	16	35.27	22.57	39.95	0	0.25	0.312	0.062	0.375
Poland	36	34.25	19.32	31.29	0.055	0.167	0.444	0.055	0.278
Slovak Republic	8	58.27	28.21	51.81	0	0.25	0.625	0.125	0
Slovenia	12	40.91	23.74	36.75	0	0	0.375	0.375	0.25
Estonia	10	56.56	20.51	55.25	0.1	0.2	0.6	0.1	0
Latvia	8	52.30	18.42	47.2	0.285	0	0.715	0	0
Lithuania	4	34.76	18.43	47.2	0	0.25	0.25	0.25	0.25
Bulgaria	10	61.1	25.6	75	0	0	0.70	0.30	0.1
Romania	6	47.5	13.04	52	0.167	0	0.333	0.125	0
Croatia	3	52.13	29.13	62.34	0	0.67	0	0	0.33
European transition countries	151	47.92	24.68	49.9	0.044	0.154	0.463	0.176	0.154
Austria	24	58.87	21.24	55.10	0.083	0.125	0.583	0.167	0.042
Germany	180	51.97	23.26	50.98	0.256	0.250	0.422	0.039	0.033
France	102	46.69	24.87	49.14	0.176	0.108	0.559	0.010	0.147
Denmark	26	20.60	18.15	13.00	0.154	0.000	0.231	0.000	0.615
Finland	20	21.10	14.29	15.64	0.048	0.048	0.190	0.190	0.524
Sweden	23	23.72	17.45	16.60	0.000	0.261	0.217	0.000	0.522
Continental Europe	594	42.05	25.41	40.74	0.152	0.164	0.425	0.039	0.219
Great Britain	439	16.23	13.85	11.99	0.086	0.082	0.109	0.000	0.723
Ireland	19	18.07	14.06	13.20	0.250	0.000	0.100	0.000	0.650
United States	1,760	19.85	14.80	14.43	0.292	0.089	0.113	0.001	0.505

Note: The controlling owner is defined as the largest shareholder holding 20 percent or more of the shares outstanding.

Firms controlled by a bank, mutual fund, pension fund, a domestic private (ex) privatisation fund, insurance company or other financial institution are categorised as financial holdings.

Data for the non-transition economies are from GMY (2004, Table 3).

Table 3 Majority Shareholders, Financial Institutions and Transitional Owners

Country	No. firms	Majority owner	State majority owner	Non-financial majority owner	Foreign largest owner	Financial Majority owner	Financial owners	Bank owners	Non-bank owners	Transitional owners
Czech Republic	38	0.710	0.289	0.368	0.316	0.053	0.237	0.026	0.210	0.263
Hungary	16	0.437	0.062	0.187	0.562	0.187	0.875	0.375	0.5	0.062
Poland	36	0.222	0	0.194	0.305	0.028	0.639	0.305	0.334	0.167
Slovak Republic	8	0.5	0.125	0.25	0.333	0.125	0.833	0.5	0.333	0.083
Slovenia	12	0.375	0.25	0.125	0	0	0.75	0.25	0.5	0.625
Estonia	10	0.7	0.1	0.3	0.4	0.1	0.9	0.8	0.1	0.2
Latvia	4	0.286	0	0.286	0.5	0	0.25	0	0.25	0
Lithuania	8	0.25	0.25	0	0.5	0	0.75	0.5	0.25	0
Bulgaria	10	0.80	0.20	0.40	0.1	0	0.3	0.3	0	0.6
Romania	6	0.667	0.5	0.167	0.167	0	0.5	0	0.5	0.5
Croatia	3	0.667	0	0	0	0.667	1.00	0.667	0.333	0.333
Transition countries	151	0.478	0.147	0.243	0.333	0.073	0.581	0.269	0.312	0.206

Note: Financial owners - companies with financial owners are these that have at least one financial institution owning their outstanding shares.

Bank owners - companies in which bank(s) only or bank(s) and other financial institutions held ownership stakes.

Non-bank owners - companies in which non-bank financial institutions held ownership stakes.

Transitional owners – companies in which the state, privatisation funds, domestic holding companies (some of them ex-privatisation funds), insiders (managers and employees), and offshore owners (owners registered in offshore zones) held ownership stakes.

Table 4 Returns on Investment (q_m) by Ownership Categories

Types of owners	I	II	III	IV	V
Non-financial*	0.25	0.14			
t-value	3.52	1.63			
Financial	-0.15	-0.22			
t-value	-1.38	-1.88			
State	0.08	0.06			
t-value	0.69	0.52			
Dispersed	-0.139	0.02			
t-value	-0.95	0.24			
Bank owners**			0.16		
t-value			2.68		
Non-bank owners			-0.20		
t-value			-3.32		
Non-financial owners			0.04		
t-value			0.67		
Foreign***				0.19	
t-value				1.69	
Transitional****					0.09
t-value					0.71
q_m	0.73	0.79	0.77	0.73	0.76
t-value	12.15	16.66	8.78	8.78	9.92
Obs.	415	415	426	426	426
Adj. R ²	0.57	0.57	0.57	0.55	0.55

Note: The table reports the effect of ownership categories. We interact the ownership dummies with the investment term on the right-hand-side of eq. 5, and include them along with investment in the specifications. All t-tests are based on White (1980) standard errors. The equations include industry and year dummies (not reported).

* The specification I uses 20 percent cut-off and specification II - 50 percent cut-off for identification of owners.

** In specification III, for bank owners and non-bank owners, see Table 3, Note. Companies with non-financial owners are these that have no any financial institution owning their outstanding shares.

*** In specification IV, foreign owners are defined as the largest owners with foreign origin.

**** In specification V, for transitional owners, see again Table 3, Note.

Table 5 Descriptive Statistics for Firms with with $q_m \geq 1$ and $q_m < 1$

Variables	All firms			Firms with $q_m \geq 1$			Firms with $q_m < 1$		
	Mean	S.D.	Median	Mean	S.D.	Median	Mean	S.D.	Median
Sales	269888	536175	121558	272386	372619	133449	267378	661995	118216
Total assets	366919	778885	141372	488270	1002587	132780	242693	413390	146395
Sales growth/year	0.12	0.41	0.09	0.10	0.30	0.07	0.13	0.50	0.09
Tobin's q	0.78	1.23	0.53	0.86	1.20	0.59	0.69	1.26	0.44
q_m	0.021	7.719	0.727	3.02	3.19	1.68	-2.14	9.18	0.078
PE (price-earning ratio)	12.58	23.76	7.82	12.84	21.06	8.44	12.32	26.18	7.14
Cash flow/assets	0.098	0.082	0.088	0.087	0.08	0.086	0.109	0.083	0.093
Cash flow/sales	0.373	2.16	0.108	0.315	1.26	0.096	0.432	2.79	0.117
ROA	0.040	0.069	0.033	0.036	0.075	0.032	0.045	0.064	0.034
Deprecation/assets	0.138	0.108	0.117	0.135	0.117	0.109	0.141	0.099	0.124
Dividends/cash flow	0.127	0.212	0.008	0.165	0.251	0.053	0.088	0.156	0.0004
Debt/market value	0.329	0.268	0.277	0.331	0.273	0.292	0.326	0.263	0.273
Debt/assets	0.173	0.153	0.131	0.195	0.152	0.189	0.149	0.151	0.094
Plant&equipment/assets	0.49	0.196	0.498	0.464	0.201	0.486	0.516	0.187	0.513
Investment/assets	0.099	0.179	0.087	0.079	0.124	0.091	0.118	0.218	0.085
IK*	0.24	0.258	0.206	0.225	0.25	0.2	0.256	0.266	0.213
CFK**	0.286	0.445	0.187	0.312	0.523	0.19	0.26	0.349	0.184
Net income/market value	0.056	0.161	0.062	0.029	0.172	0.047	0.083	0.146	0.079
Number of firms		126			60			66	

* I/K is the change of capital stock divided by capital stock

** CF/K is cash flow divided by capital stock.

Table 6 Matrix of Correlation Coefficients: All firms

	ta	I_t/K_{t-1}	CF_t/K_t	q_{at-1}	q_{mt-1}
Total assets	1.000				
I_t/K_{t-1}	-0.071	1.000			
CF_t/K_t	-0.079	0.354	1.000		
q_{at-1}	-0.04	0.189	0.208	1.000	
q_{mt-1}	0.037	0.082	0.237	0.14	1.000
Sales growth	-0.023	0.037	0.012	0.039	0.002

Note: Total assets are average total annual assets

I_t/K_{t-1} is the change of capital stock divided by the beginning of period book value of capital stock

q_{at-1} is Tobin's q calculated as the market value of equity plus the value of debt divided by total assets.

q_{mt-1} is the yearly measure of marginal q.

CF_t/K_{t-1} is cash flow (income before extraordinary items plus depreciation minus dividends divided by the beginning of period book value of capital stock.

Sales growth is average annual growth rate of total sales.

Table 7. Regression Results for Eastern Europe

Variables	All firms	$q_m \geq 1$	$q_m < 1$
CF_{t-1}/K_{t-1}	0.1687	0.1345	0.525
t-value	3.95	4.05	3.37
q_{mt-1}	0.0069	0.019	-0.0018
t-value	0.94	2.02	-0.24
Firms	126	60	66
No. Obs.	284	145	139
\bar{R}^2	0.35	0.48	0.45

Note. The table presents estimates of the investment/cash flow equation:

$$I_t/K_{t-1} = a + b CF_{t-1}/K_{t-1} + c q_{mt-1} + e$$

