

Ownership Structure and Investment Finance in Transition Economies: A Survey Evidence from Large Firms in Hungary and Poland¹

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Abstract

Using survey data on 157 large private Hungarian and Polish companies this paper investigates links between ownership structures and CEOs' expectations with regard to sources of finance for investment. The Bayesian estimation is used to deal with the small sample restrictions, while classical methods provide robustness checks. We found a hump-shaped relationship between ownership concentration and expectations to rely on public equity. The latter is most likely for firms where the largest investor owns between 25%-49% of shares, just below the legal control threshold. Profitable firms rely on retained earnings, consistent with the 'pecking order' theory. Firms controlled by domestic institutional investor are more likely to borrow from domestic banks.

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1 Introduction

After the removal of state subsidies and imposition of “hard” budget constraints on reforming enterprises in Central European countries (Kornai, 2001), it was expected that when making investment decisions, managers of restructuring enterprises would rely either on internally generated finance or external private sources that provide finance on competitive, market terms. However, the financial system that had replaced the state support remained underdeveloped, and even at the time of writing is lagging behind comparator economies (EBRD 2006). It is critical to understand factors influencing financing decisions of firms in such an environment for informing policies and incentive schemes supporting the market-oriented reform (Gros and Sahrke, 2000; Berglof and Bolton 2002; Gros and Steinherr 2004; Mickiewicz 2005; Köke and Schröder 2006). Given the circumstances, companies acquire finance for investment using alternative strategies, which are related both to the identity of the owners and to the concentration of shares. Companies with foreign owners have advantage in their access to finance that is coming from abroad. Domestically owned firms substitute for underdeveloped external financial market by forming industrial (-financial) groups. In general, firms in transition economies may use a variety of financing sources. Given the complexity of the financing decision, it is important to model simultaneously the impact of factors influencing the financing choice on the all available financing options.

Economics and finance literatures indicate that the firm’s selection of financing options may be contingent on its governance characteristics such as ownership concentration and the identity of owners (La Porta *et al.*, 1999; Macey and Miller, 1997 and others). Large-scale privatizations in transition economies created a wide spectrum of corporate governance models ranging from widely dispersed individual ownership to predominance of foreign investors (Filatotchev *et al.*, 2003; Andreff, 2006). Therefore, it is important to verify links between managerial financing decisions and corporate governance characteristics of the companies.

Considering the determinants of investment financing strategies for the firm in the economic transition, previous research suggests a number of theoretical frameworks that build on agency perspective and resource-based view of the firm. First, in the environment of not fully developed capital markets, with thin trading and low protection of minority shareholders, the degree of ownership concentration may affect the capital structure choices. In particular, equity investors are confronted with a trade-off between gains of better monitoring provided by concentrated ownership (Jensen and Meckling, 1976) and negative effects of entrenchment of the controlling shareholder who may try to extract “private benefits of control” at the expense of minority shareholders (La Porta *et al.*, 2000). Anticipating that, the dominant shareholder may be aware of the cost-of-finance implications, when making the financing decision. In particular, a strong demand for new equity issues may be relatively high when a strategic owner is present (so the agency problem is alleviated), but does not have full control. The latter may put the minority shareholders’ interests in danger by removing constraints on the dominant owner’s decisions and by increasing risk of (implicit) expropriation.

In addition, availability of private benefits of control implies that the dominant shareholder may take into account the implications of equity finance for the ownership composition, especially in the region of the ownership concentration being close to the legal control threshold of 50%. As a result, there may be a non-linear relationship between ownership concentration and reliance on new equity finance.

Research also suggests that the identity of a dominant owner may have an impact on financing strategy of the firm. For example, finance from abroad may be an important channel to overcome constraints on the domestic financial markets. Presence of foreign owners, therefore, may facilitate access to this type of finance (Filatotchev et al., 2003). In addition, institutional void theory suggests that links between the firm and domestic institutional investors may facilitate access to domestic bank finance and to the state financial support, in particular for large business groups (Filatotchev et al., 2005; Filatotchev and Mickiewicz, 2006; Okhmatovskiy, 2006).

These links between ownership structure and the firm's financing decisions may be moderated by a number of the firm-level characteristics. For example, it may be easier for large firms to overcome informational asymmetries, and, therefore, they find the access to public equity finance less difficult than smaller companies. In addition, the firm's reliance on the internal source of retained earnings may be positively associated with higher past profitability, which is consistent with the 'pecking order' theory of financing (Myers 1984; Shyam-Sunder and Myers 1999).

In general, actual financial outcomes result from the interplay between preferences of managers and characteristics of the sources of finance. In this paper we focus on managerial perceptions with regard to the future financing strategies, which enables us to increase our knowledge of the demand side of the financial contract, producing new insights (see also: Graham and Harvey, 2001). This approach is complementary to the research based on the observed financial outcomes, which utilises publicly available accounting data. Our approach matches our objectives; as we address the inter-relationship between ownership characteristics and financing strategies, an emphasis on actual observed outcomes would limit the analysis in this respect. This motivates our choice of survey-based methodology and use of survey data in empirical analysis.

Our paper's focus is on the potential financial constraints that emerged patterns of ownership and control may impose on the restructuring strategies of managers in transition firms. These constraints may be perceived as well as actual (such as a high level of debt that hinders access to new loans). However, the perceptions of managers are the ultimate factor shaping their decisions, and it is important to examine how these perceptions may correlate with corporate control characteristics. More specifically, we incorporate both observed company characteristics on one hand, and perceived restructuring investment financial strategies on the other.

The richness of the survey data enables us to consider a finer-grained range of financing options, for instance, allowing to distinguish between domestic bank loans and borrowings from foreign credit institutions. The fact that such information cannot be obtained in the public domain supplies additional justification for choosing survey methodology.

The purpose of this paper is, therefore, to provide empirical evidence on CEOs' expectations regarding firms' choice of investment finance, using a unique data set from a 2001 survey of 157 large private Hungarian and Polish companies. Managers' expectations of the importance of several types of long-term finance refer to the period 2001-2005 and are explicitly represented as a multidimensional construct, allowing for a correlation structure across five types of available, potentially interdependent financing sources. We believe that the model formulation that allows for the correlation between the perceived rankings of the financing sources is appropriate because any restrictions on the correlations are difficult to support on *a priori* ground. We develop our empirical model in Bayesian terms in order to address the problem of drawing inference from a small sample. Our model helps understanding how managers' choice of financing sources may be affected by a number of

strategic and governance factors, such as the divestment strategy, ownership concentration, presence of domestic and foreign institutional investors and relationship links to banks, controlling for the firm's size, performance and leverage. In addition, to check the robustness of our conclusions we investigate how the results of the Bayesian model compare with those obtained using classical methods.

The rest of the paper is organised as follows. Section 2 discusses the financial environment in Hungary and Poland. Section 3 reviews prior studies and develops a number of research propositions. Section 4 explains the design of our company survey and describes the resulting dataset. Section 5 introduces our approach to data analysis. Empirical results based on the Bayesian model are reported in Section 6, while Section 7 offers robustness checks based on the classical analysis. Section 8 offers a discussion and conclusions.

2 Hungary and Poland: the financial environment in transition

Rapid changes in the financial environment that have occurred during transition period, had important implications for companies that found themselves in a dire need of investment resources that could be used for restructuring and modernization. To allow a reliable analysis of the determinants of financing choices being made by the transition firm, researchers need firm-level data covering time periods representative of a sufficiently advanced stage of reform, when investment (as distinguished from reallocation) becomes again a crucial factor in restructuring and productivity enhancement. A pooled two-country sample of Hungarian and Polish companies in 2001 satisfies this important requirement. In an early phase of liberalisation of the 1990s, large productivity gains were achievable simply through a better use and reallocation of assets and did not necessitate high levels of investment. In addition, the existing evidence suggests that unlike in some other transition economies, the beginning of the new millennium saw most of the firms in Hungary and Poland facing hard budget constraints. In the year 2000, firms in these two countries had diverse industrial and corporate control structures while the two countries' integration into the EU had considerably widened the range of potential sources of investment finance. At the time, both Hungary and Poland had relatively well functioning capital markets although these were much smaller in size than capital markets in the high-income OECD economies. Since the early 1990s, the Warsaw Stock Exchange was unique in the region as a new public finance market, in contrast to other transition countries where the stock exchanges mainly functioned as primary markets for privatisation related floatations (Glaeser *et al.*, 2001). Capital markets in Hungary and Poland during the first decade of their operations were dominated by small dispersed investors who viewed companies' reputation as important in providing finance. Although the banking sectors of both economies have experienced growth, the banking sectors' size remained small while interest rates on loans stayed at relatively high levels (for overviews of Hungarian and Polish financial sectors see Carmignani 2003; Day and Taylor 2004; Drifill and Mickiewicz 2003). Having opened the economy for foreign direct investment earlier than other transition countries, Hungary recorded high levels of foreign ownership in the enterprise sector. Poland, initially was lagging behind in this area, from the mid 1990s, showed acceleration in inflow of foreign capital and by 2001 had a significant foreign-owned industrial sector.

In Hungary and Poland, privatisation was completed by a number of different methods leading to a wide variety of ownership and control structures². Firm-level data from Hungary

² See Mickiewicz and Baltowski (2003) and Major (2003) for the overviews of the Polish and Hungarian privatisation programmes, correspondingly and Havrylyshyn and McGettigan (2000); Megginson and Netter (2001); Djankov and Murell (2002), Mickiewicz (2005), and Andreff (2006) for comparative discussion.

and Poland in 2001 provides a required cross-section variation for an investigation of the associations between characteristics of ownership and control and the importance of finance sources.

3 The relationships between corporate control and finance

Prior research identifies a number of causal links between corporate control structures and long term financing choices made by the firm. A number of studies suggest that large block (outside) ownership may have a positive impact on the firm's access to external sources of finance. Companies may have large groups of undiversified shareholders that have both the incentives and the means to restrain the self-serving behaviour of managers, avoiding the free-rider problem (Shleifer and Vishny 1997, p. 754; see also Wruck 1989).

However, the firm level governance factors should always be interpreted in the context of national corporate governance and legal frameworks. A rapidly developing "law and economics" research suggests that the firm's financing strategies may be shaped by the extent to which minority investors are legally protected from the opportunistic behaviour of controlling shareholders. In countries where controlling shareholders are weakly constrained in their search of "private benefits of control", firms with the dominant (majority) shareholders will differ in terms of their access to external finance from businesses where the distribution of share-ownership is more even.³ Where large investors gain full control over a company, they may follow their own interests, 'which need not coincide with the interests of other investors in the firm ... as ownership gets beyond a certain point, the large owners gain nearly full control' and may 'prefer to use firms to generate private benefits of control that are not shared by minority shareholders' (Shleifer and Vishny, 1997, p. 758-9). Anticipating that, small investors may be less willing to buy the firm's shares and, as a consequence, new equity issues are becoming less attractive to the dominant shareholder with legal control. In addition, the effect may be reinforced by expected implications of the new equity issue for the ownership structure: to retain their private benefits, dominant owners may not be willing to dilute already acquired legal control with newly issued shares.

Thus, we may observe a non-linear effect of ownership concentration on managers' choice of equity finance, which concurs with the argument in Morck *et al.*, 1988. In general, companies with strategic owners with share ownership below the legal control threshold may be most interested in new equity finance. On one hand, they will be more attractive to investors than companies with dispersed ownership, due to perceived disciplining effects on managers. On the other hand, the investors may find these companies more attractive than those with fully concentrated ownership, due to a possibility of expropriation in the latter case.

In addition to the level of ownership concentration, institutional and resource-dependency theories emphasise that the identity of the large-block shareholder may have impact on financing sources of the firm.

From resource dependency perspective, firms with foreign ownership may be less restricted in their access to external finance (Galindo and Schiantarelli, 2002; Harrison and McMillan, 2003; Mickiewicz *et al.*, 2004; Bonaccorsi, 1992). More specifically, foreign owners may provide funds or make it easier to raise finance in the overseas capital markets and borrow from non-resident banks.

In addition, the firm's membership in financial-industrial (business) groups organised around domestic capital may facilitate access to both bank finance and government-sponsored

³ In the extreme case, when there is no effective protection of minority shareholders, the ownership will simply converge towards 100% owned by the controlling stakeholder, as minority shareholders will not be willing to buy any shares (Fama and Jensen 1983).

finance via formal and informal networks. These networks are usually cemented through the web of cross-shareholding, with the major shareholder being another domestic industrial corporation or a bank (Khanna and Palepu, 2000; Filatotchev et al., 2001; Filatotchev and Mickiewicz, 2006). However, business groups in transition economies are notorious for their “opaqueness” and lack of transparency with regard to outside minority investors. Therefore, we expect that corporate and financial block-holders in transition economies will be associated with a higher reliance on bank finance and state support as opposed to equity investment.

These links between governance characteristics of the firm and its financing strategies may be moderated by a number of firm-specific characteristics.

Previous studies suggest that firm's size is an important factor explaining financing choices. Size may serve as an inverse proxy for the extent of informational asymmetries between the firm's insiders and external finance providers. Therefore larger firms are expected to be more capable of raising information-sensitive finance such as public equity or public debt (Rajan and Zingales, 1995; Keasey and Watson, 1993; Jarvis, 2000). Smaller firms face tighter constraints (Schiantarelli 1996; Colombo and Driffill, 2003). The empirical evidence on the positive links between size and access to external finance is provided by Fazzari *et al.* (1988), Gertler and Gilchrist (1994) and Bernanke *et al.* (1994). However, Hu and Schiantarelli (1994) and Kadapakkam *et al.* (1998) report opposite results. It follows that the link between size and financing options may be specific to macroeconomic conditions, institutional structures and the nature of the financial intermediation (Lamont *et al.*, 2001).

In terms of the performance effects on financing choices, high profitability leads to more internal funds and, if interest rates on borrowings are high, profitable firms will show preference for financing with retained earnings and demand less credit (De Hass and Peeters, 2004). This behaviour is consistent with the ‘pecking order’ theory of financing (Myers, 1984; Harris and Raviv, 1991).

In addition, the firm's intention to divest may be a proxy for financial distress accompanied by defensive restructuring. Divestment may indicate ‘defensive restructuring’ and downsizing in firms that are less efficient in active adaptation to the market environment (Carlin *et al.* 2001b) or financially distressed. Undergoing restructuring firms may also seek access to fresh finance in order to stay in business, but divestment may be taken as negative signal by external providers of finance making it more difficult to obtain.

In sum, previous research indicates the importance of such factors as ownership concentration, owner identity, firm size, profitability, intentions to divest and close relationships with banks and industrial partners in terms of their effects on the relevance to financing preferences of the transition firm. Empirical relationships may be then interpreted in light of the theoretical arguments of agency theory and institutional framework.

4 Sample description and variables

For our analysis, we use a data set that has been generated by a questionnaire survey of large private companies in Hungary and Poland carried out in the 2001. The companies were drawn from the population of large private non-financial companies as defined by reliable public sources. A list of the top 500, by turnover, companies produced by the Institute of Economics of the Polish Academy of Sciences and published by *Rzeczpospolita*, a top broadsheet, covering finance and business law, was employed as a frame for random sampling of Polish firms, while the Hungarian firms were drawn at random from a list of the top 200 companies compiled by the *Figyelo* magazine. The survey resulted in 157 useable questionnaires, representing 100 Polish and 57 Hungarian firms. The generalisation of our results is limited by the fact that the sample characteristics divert in some respects from the population characteristics. This is related to the fact that the sectoral structure of our sample does not correspond entirely to the population structure (for definitions of sectors, see Table 1 below). In particular, services and construction companies are underrepresented (7% of the sample versus 37% in the population) and both labour intensive branches and high technology branches are over represented (36% in our sample versus 23% in the population for the first category; 27% versus 16% for the second category). In turn, the percentage of firms in both heavy industry (5% versus 4% in population) and resource-intensive industries (20% versus 17% in population) is similar. The sectoral characteristics imply that on average, our firms are smaller in terms of sales (as services including trade are under represented) but larger in terms of employment (as labour intensive branches are over represented). On the other hand, the percentage of firms with some foreign presence is not that different: 62% in the sample, versus 72% in the population of largest companies. We have no population data on ownership concentration to compare with our sample.

Definitions of variables and descriptive statistics can be seen in Table 1. Median employment values are 596 for Poland and 542 for Hungary, but the distributions are skewed due to the presence of a few very large companies, especially in the Hungarian sub-sample, where the largest company had 15,599 employees at the end of 2000. For that reason the mean employment values are higher than the medians for both sub-samples, being 907 for Poland and 1,403 for Hungary. Distributions of the two measures of size in 2000, in terms of assets and turnover, have similar shapes with the median values being higher for Poland than for Hungary, while the opposite is true for the mean values. Based on the full sample the median turnover was US\$37.7 million while the median value of total assets was US\$26.4 million (at book values).

Credible investigators from the Research Department of the Polish Sociological Society and the Institute of Economics of the Hungarian Academy of Science were pivotal to the implementation of the survey. The two teams conducted in their respective countries face-to-face interviews, seeking chief executive officers' views on access to finance and collating information on other company key characteristics. Both country teams have extensive research experience in enterprise surveys, possess good practical knowledge about intra-company personal relations and use a wide range of response-enhancing techniques. In comparison with some other post-communist countries, especially the CIS countries, company accessibility for conducting survey-based academic research in Poland and Hungary has been good, especially in the case of largest firms, which are generally more accustomed to openness than smaller enterprises.

When designing and testing the questionnaire, one important concern was to address a possible problem of sensitivity of owners and managers towards a number of items related to ownership and control structures. Most reports from surveys of enterprises in the transition

countries suggest that up to 10-15% of interviewees may refuse to co-operate and provide answers. Item non-response rates in our interview survey were of similar magnitudes, giving rise to the issue of appropriate treatment for missing data in a subsequent data analysis. Fewer difficulties were encountered by our investigators in relation to the questionnaire items dealing with financial performance and position of firms since in both countries company reports are available to external parties and under the adopted regulations large firms disclose sufficiently detailed and reliable accounting information.

We employ three measures of corporate control (Table 1). Ownership concentration is expressed in terms of the largest shareholder's stake. The sample firms have a high degree of ownership concentration. In the full sample, the dominant owner controls on average 62.5% of shares while the largest shareholders have a 69.8% stake in a Hungarian firm and a 58.8% stake in a Polish firm.

The binary variables 'foreign presence' and 'largest shareholder being domestic institutional investor' add further two dimensions of corporate control. In our sample, 62.4% of firms have foreign owners while domestic institutional investors hold the majority stake in 31.4% of firms.

We constructed the performance measure as the average profitability over previous three years based on the ratio of earnings before taxes (but after financing expenses) to total revenues. We observe skewed profitability distributions due to a small number of companies reporting high profitability. In particular, in 1988-2000, Hungarian companies demonstrated higher profitability than Polish firms, with median values being respectively 1.51% and 0.26%.

Financial position is defined in terms of overall indebtedness since balance sheet data necessary for separating long- and short-term debt obligations was unavailable. We proxy indebtedness by the ratio of total liabilities over total assets measured at book values. The distribution of the indebtedness variable is clearly non-normal. While the median values for the country sub-samples are similar, the means values differ. In the Hungarian sub-sample, the mean is smaller than the median due to the presence of several firms with relatively low indebtedness. For the full sample, the median is 56.1% and corresponding values for Hungary and Poland are 57.4% and 54.7%.

Managers' strategic choices of various sources of investment finance are in the focus of our study. However, reporting standards in transition economies do not provide a detailed breakdown of internally and externally generated investment resources. More specifically, company reports do not differentiate between foreign and domestic lenders, and they do not provide any indication of state financial support. Another difficulty is associated with our focus on managers' strategic intent, whereas company reports provide data on strategic outcomes, such as debt-to-equity ratio, total debt, etc.

To overcome these problems we used perceptual data generated by managers' responses to questions about the importance of various sources of finance for their future investment projects. The data set includes an array of ordinal categorical variables that measure the relative importance of alternative sources of finance for investment and capture intentions to divest. This is achieved by drawing upon the items reflecting perceptions of chief executive officers of the sample firms on the importance of finance types in funding modernisation (investment) programmes planned by their firms. The importance of internally generated funds is analysed by investigating the roles of *retained earnings (profits)*. Intentions to overcome financial distress and to raise funds via divestment are represented by the two indicators, *selling stakes in other firms* and *selling or leasing out buildings and equipment*. In addition, we have information on the degree of access to external funds via issues of *equity* and *corporate bonds*, and also by *borrowing from local (domestic)* and

foreign banks, support from the state, and credit from industrial partners. A common Likert 7-point scale, running from ‘1’ *not important* to ‘7’ *high importance*, was used to reflect managers’ assessment.

The overall pattern of relative importance of finance sources for the sample companies in both countries is very similar. *Retained earnings* (the average score = 5.15) followed by *credit from local banks* (the average score = 4.17) were identified as the two most important sources of finance for investment. This is consistent with macroeconomic data, which demonstrate that both Poland and Hungary evolve towards bank-based financial systems (EBRD, 2006). For both countries the third most important source of finance is *sell-off or leasing of assets* (2.29), which indicates that privatised companies are actively seeking to restructure and overcome the legacy of asset composition inherited from the communist period.⁴ Next comes *state support for investment* (2.01) provided presumably under industry sector restructuring programmes and *credit from foreign banks* (2.01). Somewhat less important roles are played by *equity issues* (1.89) and financial restructuring via *sell-off of shareholdings* in other companies (1.66). The two least important sources of finance are *credit from industrial partners* (1.45) and *issue of corporate bonds* (1.40).

5 Methods

Managers’ preferences with regard to future strategies for generating new finance represent a multidimensional decision-making process that involves choices between internal source of finance (retained earnings) and external sources of equity, debt and support extended by the state. The questionnaire design also allows for the further fine-tuned analysis of external debt decisions by differentiating between the issuance of corporate bonds, loans from local and foreign banks and credit from industrial partners. For a company that undergoes restructuring and is involved in complex operations, a viable strategy might be based on raising new finance simultaneously from a variety of sources. A modernisation programme may rarely be accomplished by using just one type of new funds with the implication that some combinations of sources may be viewed by the company’s manager as complimentary, while other options may be competing with each other. It seems possible that in assessing on an ordinal scale the relative importance of individual sources of funds, the manager could envisage various combinations, which in turn leads to the statistical dependence between the rankings given to individual types of finance. A joint analysis of accessibility of individual sources of funds is required, and this suggests statistical framework that takes into account possible inter-dependence between the scores assigned to individual sources.

Our primary interest is focused on the impact on financing policy decisions of a number of relevant plausible factors suggested by prior studies into company finance for the transition context. In examining the effects of firm-specific attributes such as ownership and control structures, banking relations, size, performance and indebtedness we further add to the vector of covariates the controls for intentions to sell /divest surplus assets and for sectoral and country differences.

In the light of the interrelations between financing policies, the importance of a finance type is related not only to similar firm-specific features, but also directly to the accessibility of other sources of funds. The natural technique for modelling jointly interdependent decisions

⁴ The ranking reported here is consistent with findings by Carlin *et al.* (2001a) for privatised companies (see Table 10 there). In addition Carlin *et al.* (2001a) explore in more detail the underlying reasons of financial constraints (collateral, high lending rates, paperwork/bureaucracy etc.), see Table 11 there.

on modernisation finance is a system of equations with dependent variables capturing the importance of individual sources of funds and allowing for a general correlation structure across financing options.

The endogeneity of the ownership variables is always a problem when one uses cross-sectional data. However, our ownership variables are measured in period T, whereas managers' expectations are related to year T+1 and beyond. In other words, our research design assumes at least one period lag between the dependent variable and the explanatory variables, including ownership variables, which reduces the endogeneity problem. We emphasize that we do not claim solving the endogeneity problem, but our research design helps to mitigate it. Conceivably, there could be a feedback from the expectations of financing to ownership, in which case using lags would not eliminate the problem entirely. However, we think that a strong feedback of this kind is unlikely.

As is the case with many survey studies, missingness in data in a form of incomplete records becomes a problem. If the data is missing on random (which in fact implies the data is more reliable), any application of multivariable estimator results in serious reduction in records available, as the cumulative effect of missingness in many variables eliminates a significant amount of available information, which could be used for estimation. For this reason we apply a Bayesian approach, where all available information is utilised. Subsequently (in Section 7) we provide robustness checks based on classical estimators. Detailed discussion of the Bayesian methodology is provided in Appendix. To reflect the ordinal and correlated nature of our dependent variables we employ a simultaneous model for ordered outcomes using the factor analysis formulation for modelling ordinal correlated data (see, e.g., Song and Lee, 2001). In our probability model we set vague normal priors with zero means and large variances for the regression coefficients β so as to let the data dominate the form of the posterior distributions. As a result, our Bayesian estimates are at least as conservative as those obtained using classical methods.

6 Results based on the Bayesian model

The Likert-scale questionnaire provides us with data on the choice from the nine potential sources of finance for modernisation investment programmes (see ranking of answers in terms of mean values at the end of Section 4). We treat asset divestment as a control variable, which leaves us with eight potential choices of finance. We run two models, one with all dimensions and one with only five most popular financial options retained. The results for the full model do not differ significantly from the smaller model, as the three least popular options add very little in terms of significant results. While they are available on request, because of space constraints, we present only the results for the model with five simultaneous equations: for retained earnings, loans from the domestic banking sector, loans from abroad, public equity finance, and government sponsored finance.

Tables 2A and 2B present the Markov Chain Monte Carlo (MCMC) output. The posterior distributions of regression coefficients are summarised in terms of their means and 95% Bayes credible intervals. In each dimension, inference is based on the last 100,000 samples with a 60,000 burn-in.

Consistent with our expectations discussed in Section 3, public equity issues are less likely both in the case of the firms where the dominant shareholder owns 50-100% (legal

control) and by the firms with the most dispersed ownership (below 25%). This may be due to two different yet complementary reasons.

First, the CEOs of companies in the 25-49% ownership concentration group anticipate highest market demand for new shares, as compared both with the companies with highly dispersed ownership and with the companies with legal control. In this group characterised by moderate concentration, the positive effect of enhanced monitoring is not yet outweighed by the expropriation risk perceptions of equity investors and that makes equity issues attractive.

Second, owners with legal control may be hesitant to issue shares as that could be associated with loss of benefits of control resulting from share dilution.⁵ This second interpretation is consistent with earlier survey evidence that control is of considerable value to managers and owners in transition economies (Filatotchev *et al.*, 1999).

While our results are in line with the literature which points to non-linearities caused by ownership concentration (Morck *et al.*, 1988), in addition they specifically point out to the importance of the legal control (50%) ownership threshold (see also further robustness checks in the next section). This is entirely in line with new results obtained for Western European economies, which demonstrate similarly that control thresholds are important (Kirchmaier and Grant, 2005).

We obtain several other results.

In terms of the effects of the identity of large-block holders on financing choices, having a domestic institutional investor as the dominant owner raises CEOs' expectations to borrow from the local banks, and also to access state finance. Additionally, we find that presence of foreign investors facilitates access to bank finance from abroad.

In terms of the firm's characteristics, size has a positive effect on managers' preference for public equity issues, which are most sensitive to information asymmetries, as expected. Parallel to that, past profitability, which may also be seen as a proxy for expected future returns, is also significantly associated with access to public equity finance. Interestingly, the same two results hold for the provision of finance from abroad, where the effect of past profitability is significant and positive, while the effect of size is positive and marginally insignificant. The results for these two firm-level factors are consistent with general findings on firm's characteristics attracting foreign investment (Kang and Stultz 1997; Dahlquist and Robertsson 2001; Bishop *et al.* 2002).

The reported parameter estimates imply that the importance of retained earnings increases with profitability of firms, in line with the 'pecking order' perspective.

Sectoral affiliation plays an important role in shaping managerial expectations about future options of long-term financing. Firms in heavy industry (the omitted reference category in Table 2) are least likely to rely on retained earnings, which one would expect given their low profitability. Also, Polish companies' managers are less optimistic about availability of retained earnings.

7 Robustness checks: ordered probit results

In this section we offer a comparison of the results obtained from the Bayesian model, with those based on the standard regression methodology. Given, the reduced size of the

⁵ We are indebted to the anonymous referee for the discussion of this issue.

sample, the implementation of a more ambitious multi-equation model is impractical. Therefore, we restrict ourselves to the series of parallel ordered probit estimations (on methodology, see: Wooldridge, 2002 or Greene, 2003).

When the standard regression methodology is applied, due to incomplete records, the specifications based on the same set of variables reduce our sample from 157 to 83 firms, which confirms the methodological issue discussed in Section 5. Clearly, a significant amount of information is lost in the classical analysis of survey data.

The results are illustrated with Tables 3 and 4 below. Table 3 replicates the specifications adopted for the Bayesian model. Table 4 presents further robustness checks for the determinants of public equity financing, where we alternate the construction of the ownership concentration variable.

Our main interest is in the link between ownership concentration and financial strategy based on equity finance for new investment. The pattern we obtained using the Bayesian model holds, with financial strategy based on the equity finance being most characteristic for ownership concentration in the range of 25-49% percent. While this category taken alone is now marginally insignificant at 10% level, all concentration categories taken together remain significant at 1%.

To test the robustness of these results further, we experimented with other specifications changing the definition of the concentration variables. The emerging pattern is that when ordered by the significance level, the specifications based on the categorisation dominate those based on continuous ones (linear and polynominal).

With respect to the continuous specifications, the cubic specification is jointly significant at 10% level (with all terms negative), and the quadratic specification is significant at 5% level, with the linear term positive and the quadratic term negative, leading to a maximum positive effect on equity issues around 13% held by largest shareholder. However, both of these specifications are dominated by a simple linear specification, which comes with negative sign (significant at 5%). The latter one we report as specification (4) in Table 4.

However, the linear continuous specification is in turn dominated by the specifications based on the categorisations.

With respect to the categorisation, we changed our first cut-off to 20% (consistent with the fact, that block ownership of 20% of shares triggers some shareholders' rights, including board representation), however the results are less significant (unreported). In addition, while 25% threshold remains important (but should still be taken as approximation!), the 75% is not; this is consistent with Bayesian results, where the latter cut-off point was also not significant.

In fact, the most significant specification we obtained is with just one dummy variable representing the 25%-49% category, with a positive coefficient (reported as specification (1) in Table 4). This result is even sharper than the Bayesian results. In the latter case, there was a significant difference between this category and the benchmark 0%-24% category. Here we cannot reject a hypothesis that 25%-49% category is associated with more equity finance than both lower and higher levels of concentration of shares.

Summarizing these results, we found additional support for the significance of the legal threshold level, that is, dominant shareholders with legal control are far less interested in new equity issues as financing strategy. In addition, a second result holds. That is, equity issues are also more attractive for owners with some degree of concentration than for those with very small holdings, i.e. where ownership structure is very disperse. We interpret this as consistent with the stronger demand from investors, which makes equity issues more attractive. Investors prefer a situation, where a strategic owner exert some monitoring role and

may have impact on restructuring strategy, but on the other hand does not have legal control, which could result in abuse of minority shareholders.

All other results of the Bayesian model are also supported, with one interesting exception. We obtained a significant positive effect of close links with a leading bank on financing strategy based on bank credit. In contrast, in the Bayesian model, the same variable had a negative significant effect. The explanation of this apparent contradiction may relate to the fact that the Bayesian model estimates all the financing outcomes jointly. While presence of leading banks could facilitate access to credit finance, it may also have an additional stronger effect, as leading banks have more influence on the firm's capital structure choices and may encourage their clients to adopt a more balanced capital structures (see Kayhan and Titman, 2007). This is the latter effect that may drive a change of sign in the multi-equation Bayesian model.

8 Discussion and conclusions

Results from our multidimensional analysis support stylised facts with regard to the choice of investment finance in the transition countries with not yet fully developed financial systems. They also emphasise the important roles of corporate governance variables.

Our findings indicate that managers' preferences for financing sources are sensitive to the degree of ownership concentration, and this relationship is not a continuous one, being strongly affected by the legal control threshold (50%). Companies with ownership concentration within the range of 25-49% expect high demand from the providers of public equity finance, supporting agency arguments developed by Shleifer and Vishny (1997). We see this result as our contribution to the literature, as most of the existing empirical evidence on the link between ownership, performance and finance applies to the companies quoted on the US stock exchange. In the financial and institutional environment we discuss, the incentive effect seems initially to go hand in hand with concentration of ownership, but become clearly dominated by entrenchment effects once as the dominant owner acquires legal control.

In addition, we find that owners' identity influences the perceived importance of financing sources, namely, companies with presence of foreign investors find access to finance from abroad more easily, while domestic institutional investors expect easier access to domestic bank loans and to state sponsored finance.

We also identified a number of firm-level characteristics that affects managers' financing strategies. Significance of size and past profitability variables may be explained by the presence of investors concerns with informational asymmetries and associated agency costs. In addition, our results are consistent with the standard 'pecking order' theory.

By focusing on the governance effects on investment decisions, we have extended further previous research that was mainly focused on bilateral links between governance factors and the debt versus equity choice. Our analysis suggest that the firm's ownership characteristics, such as ownership concentration and owners' identity may have simultaneous effects on a wide range of managers' financing options that include internal and external sources of finance.

Our findings have important implications for investors and policy-makers in transition economies. Firms competing within transition economies face a ‘high velocity’ environment of rapid political, economic, and institutional changes that are accompanied by relatively underdeveloped factor and product markets. These environmental uncertainties with which firms must deal if they want to survive in the long run create the need for upgrading and re-configuring existing resources and capabilities. The EU accession process and internationalization of transition economies such as Poland and Hungary imposed new demands on domestic firms to develop their dynamic capabilities that enable them to take advantage of new opportunities, including gaining access to new product markets. In this context, having timely access to a variety of financing sources may be a pre-requisite of the firm’s survival and growth. However, our research shows that the range of managers’ strategic choices is contingent on governance factors.⁶ Retaining benefits of control still appears to play an important role in decisions to raise external finance, as owners with legal control tend to rely less on equity finance. It implies that further corporate governance reforms related to enforcement of minority shareholders rights may lead to more efficient financing structures. In addition the presence of the strong links between domestic companies and domestic banks suggests that there is a scope for enhancing competition in the banking sector that could result in further diversification in sources of loan finance and lead to improved and more even conditions for financing of enterprises. We expect that the progress of financial integration enhanced by the EU accession will have positive impact in this respect.

⁶ We are indebted to the anonymous referee for the discussion of these points.

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APPENDIX: Methodological discussion

In this study, we use a Bayesian approach for analysing ordinal response data obtained from the survey. A fundamental strength of Bayesian modelling is that posterior parameter estimates are assumed to have a distribution and therefore give more realistic picture of uncertainty. Other natural advantages over the modelling strategy relying on asymptotic theory include: (i) avoiding the assumption of infinite amounts of forthcoming data; (ii) the potential for handling missing values as part of the estimation process; (iii) a direct interpretation of posterior credible intervals for model parameters and (iv) finite sample results (see, e.g., Gilks *et al.*, 1996; Gill, 2002; Congdon, 2003; Greene, 2003). In the Bayesian framework, the likelihood of the observed data with given model parameters, is used to modify the prior beliefs and the update knowledge is then summarised in a posterior distribution (for details see, e.g., Spiegelhalter *et al.*, 2000; Congdon, 2003). The main variables of interest in our analysis are regression coefficients of explanatory and control variables. The posterior distributions of these parameters obtained using MCMC methods are summarised in the next section in terms of means and credible intervals.

An advantage of Bayesian modelling is that missing values are treated as another set of unknown quantities which facilitates the estimation of a model, involving explanatory covariates with incomplete records since the model specifies the prior distributions for all unknown quantities and the likelihood for the data. As discussed in Section 4, our survey data contains missing values resulting from the failure to obtain answers to some individual items, however we should note that the incomplete data problem is not acute with average item non-response rates being in order of 10-15 per cent. Simply deleting companies with missing values from the analysis would have reduced dramatically the number of data points available for fitting a model. Given that in our data set missingness occurs at relatively low rates, a reasonable strategy is to base a missing covariate imputation model on a missing completely at random mechanism⁷ with appropriate prior distributions being specified for the covariates with incomplete records to generate samples for missing data. We emphasise that all continuous covariates are standardised to reduce correlation in posteriors and improve numerical stability in running MCMC simulations. The probabilistic structure of a standardised covariate with incomplete records is then accommodated by using the standard normal as a suitable uninformative prior. Missingness in categorical covariates is modelled by choosing categorical prior distributions with equal frequencies in the levels used for categorisation. Thus despite the constraints on the completeness of data, the richness of qualitative information, gained by the survey, enables us to get a further insight into the firm-specific, industry-level and economy-wide factors underlying access to finance in Hungarian and Polish firms.

To reflect in modelling the ordinal and correlated nature of our dependent variables we employ a simultaneous model for ordered outcomes using the factor analysis formulation for modelling ordinal correlated data (see, e.g., Song and Lee, 2001).

We observe a J -dimensional ordinal outcome on J types of financing sources. For each of n observations (firms), $i=1,\dots,n$, the values of J ordinal responses are recorded in the vector

$$\mathbf{y}_i = (y_{i1}, y_{i2}, \dots, y_{iJ}).$$

Let $J_j \geq 2$ represent the number of categories for the j th response, $j=1,\dots,J$, and let denote the k -dimensional covariate vector of i th observation.

⁷ Data are missing completely at random when the missing data values are a simple random sample of all data values (see Little and Rubin, 1987).

$$x_i = (x_{i1}, x_{i2}, \dots, x_{ik}).$$

Ordered outcomes are modelled by introducing an underlying, latent, continuous structure.

If we denote by

$$Z_i = (Z_{i1}, Z_{i2}, \dots, Z_{iJ})$$

the vector of latent continuous responses (specialized factors) that results in observed categorical responses y_{ij} , then the unknown thresholds θ_{lj} determine the observed category for y_{ij} as follows:

$$y_{ij} = l_j \text{ if } Z_{ij} \in [\theta_{l_j-1}, \theta_{l_j}] \text{ where } \theta_0 = -\infty, \theta_{J_j} = +\infty \text{ and } \theta_1 < \theta_2, \dots, \theta_{J_{j-1}}.$$

The likelihood model for latent data Z_i is formulated in terms of covariate effects and stochastic disturbances. If we let the mean of the underlying distribution of latent data μ_{ij} depend on explanatory covariates x_i , we obtain the regression representation

$$Z_{ij} = \beta_0 + \beta_j x_{ij} + \varepsilon_{ij}$$

with the restrictions $\beta_0=0$ and $\theta_l=0$ to ensure that the mean of a latent construct is identified.

To reflect in modelling the correlated preferences regarding J possible financing sources, latent data Z_{ij} are assigned a multivariate normal distribution to specify multivariate dependence between the specialized underlying factors:

$$Z_{ij} \sim N_J(\beta_{ij} x_{ij}, \Sigma).$$

where Σ is an unconstrained covariance matrix with $J(1+(J-1)/2)$ free parameters.

The cumulative probabilities τ_{ij} are easily computable using the Probit link:

$$\tau_{i,l_j} = \Pr(Z_{ij} \leq \theta_{l_j}) = \Phi(\theta_{l_j} - Z_{ij})$$

Therefore, the probability of observation i being classified in an intermediate category l_j is given by differencing the cumulative probabilities of scoring category l_j or less, and of scoring category l_j-1 or less:

$$\pi_{i,l_j} = \tau_{i,l_j} - \tau_{i,l_j-1}.$$

We achieve sampling for the observed, ordinal indicator y_{ij} by using a categorical distribution

$$y_{ij} \sim \text{Categorical}(\pi_{i,l_j})$$

To complete the full probability model specification we set vague normal priors with zero means and large variances for the regression coefficients β so as to let the data dominate the form of the posterior distributions. The ordering of the thresholds corresponding to the ordinal categories is obtained by setting truncated normal densities as the priors on the thresholds. An inverse-Wishart prior is declared for the variance-covariance matrix Σ .

Table 1: Variable description and descriptive statistics (means and standard deviations)

Mnemonic	Definition	Full Sample			Poland		Hungary	
		Obs	Mean	Std.Dev.	Mean	Std.Dev.	Mean	Std.Dev.
Covariates								
domestic_instit_investor	Largest shareholder = domestic institutional investor (industrial company or financial institution), a dummy variable	121	.31	.47	.31	.47	.32	.47
foreign_presence	Presence of foreign investor	157	.62	.49	.59	.49	.68	.47
leading_bank	One or two leading banks, a dummy variable	135	.20	.40	.23	.42	.14	.35
largest_shareholding_%	Proportion of shares held by the largest shareholder (per cent)	122	62.46	32.60	58.77	33.81	69.76	29.09
ebt/sales_(2000)	Earnings before taxes ('gross profit') over sales, average for 1998-2000, percentage	129	2.16	8.83	.90	8.98	5.08	7.80
debt/assets_(2000)	Ratio of debt to total assets in 2000: (assets less shareholders funds)/assets	125	.52	.40	.56	.28	.44	.60
employment_size_(2000)	Employment in 2000	137	1063	1771	907	86	1404	2891
ind_heavy	Heavy industry (ISIC: <14 and 27)	152	.05	.22	.02	.14	.10	.31
ind_labour_intensive	Labour intensive industry (ISIC: 15-20 and 36)	152	.36	.48	.38	.49	.33	.48
ind_resource_intensive	Resource intensive industry (ISIC: 21-26)	152	.21	.41	.19	.39	.25	.43
ind_med&high_technology	Medium and high technology industry (ISIC: 28-35)	152	.34	.47	.34	.47	.33	.48
ind_services	Services and construction (ISIC: 45, 50-52, >55)	152	.05	.22	.08	.28	.00	.00
divest	Binary indicator of importance of divestment. It takes one if the average score of ordinal indicators 'sale or leasing of assets' and 'sale of shareholdings in other companies \geq 4.	141	.11	.32	.15	.36	.04	.20
Indicators of Importance of Financing Source ^a								
fin_sale_of_assets	Sale or Leasing of Assets	142	2.29	1.81	2.24	1.76	2.37	1.91
fin_sale_of_shares	Sale of shareholdings in other companies	141	1.66	1.47	1.57	1.29	1.84	1.76
fin_retained_earnings	Retained Earnings	142	5.15	1.92	5.37	1.85	4.76	2.00
fin Domestic bank credit	Bank Credit, Domestic	142	4.17	2.11	4.34	2.14	3.84	2.03
fin_foreign_bank_credit	Bank Credit, Foreign	142	2.01	1.75	1.87	1.65	2.26	1.91
fin_industrial_partners	Credit from industrial partners	141	1.45	1.23	1.51	1.32	1.35	1.03
fin_state_support	State Support	141	2.01	1.72	1.88	1.70	2.24	1.75
fin_issue_of_equity	Issue of Equity	138	1.89	1.62	1.76	1.36	2.15	2.01
fin_issue_of_bonds	Issue of Bonds	138	1.40	1.16	1.35	1.11	1.49	1.26

^a Assessed on a 7-level Likert scale, with '1' denoting 'not important'

Table 2A. Results of the simultaneous model for ordered outcomes (Bayesian)

	Retained earnings			Domestic bank loans			Foreign bank loans			Public equity			State support		
		Credible interval end points			Credible interval end points			Credible interval end points			Credible interval end points			Credible interval end points	
Variables:	Mean	2.50%	97.50%	Mean	2.50%	97.50%	Mean	2.50%	97.50%	Mean	2.50%	97.50%	Mean	2.50%	97.50%
assets_2000	-0.050	-0.163	0.061	-0.061	-0.201	0.142	0.042	-0.104	0.189	0.284	0.051	0.524	-0.170	-0.423	0.064
aver_ebt/sales (98-2000)	0.686	0.395	0.847	0.106	-0.052	0.282	0.517	0.358	0.725	-0.428	-0.598	-0.209	0.079	-0.193	0.352
debt/assets_2000	-0.162	-0.342	0.091	0.072	-0.142	0.253	0.178	-0.084	0.396	0.004	-0.283	0.219	-0.032	-0.204	0.239
Divest	-1.222	-1.599	-0.944	-0.750	-1.079	-0.331	0.022	-0.429	0.484	-0.045	-0.818	0.610	0.156	-0.633	0.704
Domestic_inst_investor	0.370	-0.083	0.904	0.866	0.325	1.241	-0.314	-0.817	0.134	-0.788	-1.079	-0.494	0.682	0.244	1.209
foreign_presence	-0.119	-0.425	0.234	-0.050	-0.384	0.256	0.718	0.285	0.935	-0.475	-0.810	-0.196	-0.091	-0.487	0.286
leading_bank	-0.001	-0.563	0.459	-0.447	-0.766	-0.094	-0.119	-1.307	0.341	0.341	-0.121	0.737	0.213	-0.157	0.612
Largest shareholder's share (omitted benchmark category: 0-24%):															
25-49%	-0.125	-0.658	0.353	-0.100	-0.507	0.263	-0.075	-0.549	0.604	0.727	0.252	1.086	0.154	-0.215	0.487
50-74%	-0.342	-0.946	-0.006	-0.081	-0.466	0.216	-0.640	-0.965	-0.290	-0.241	-0.653	0.444	-1.526	-1.887	-0.919
75-100%	-0.050	-0.461	0.231	0.384	-0.009	0.750	0.309	-0.091	0.774	-0.233	-0.823	0.213	-0.665	-0.999	-0.317
Industrial sector (omitted benchmark category: heavy industry and mining):															
ind_labour_intensive	1.607	1.045	2.241	0.751	0.426	1.001	-1.275	-1.603	-0.899	-0.836	-1.151	-0.542	0.351	-0.117	0.735
ind_resource_intensive	1.841	1.470	2.325	0.989	0.530	1.404	-0.433	-0.974	-0.063	-1.215	-1.606	-0.723	0.321	-0.412	1.348
ind_services	2.254	1.548	2.916	1.262	0.554	1.865	-0.112	-0.941	0.789	-2.023	-3.533	-0.443	0.690	-0.169	1.480
ind_med&high_tech	1.598	1.339	1.967	0.395	0.027	0.779	-0.876	-1.268	-0.522	-0.142	-0.816	0.400	0.574	0.182	0.988
Poland	-0.363	-0.627	-0.118	0.203	-0.205	0.552	0.186	-0.052	0.435	0.562	0.161	0.895	-1.091	-1.448	-0.802

Notes: (i) Number of observations: 157; (ii) Credible intervals that exclude zero are in bold.

Table 2.B: Variance-covariance Matrix Σ

	Retained Earnings	Domestic Bank Loans	Foreign Bank Loans	Public Equity	State Support
Retained Earnings	0.012	-0.047	-0.050	-0.062	-0.066
Domestic Bank Loans		0.318*	0.344*	0.437*	0.475*
Foreign Bank Loans			0.385*	0.469*	0.524*
Public Equity				0.645*	0.663*
State Support					0.732*

Note: credible intervals that exclude zero are marked with an asterisk.

Table 3. Results of the ordered probit models (classical)

	Retained earnings			Domestic bank loans			Foreign bank loans			Public equity			State support		
		Robust			Robust			Robust			Robust			Robust	
Variables:	Coef.	Std.Err.	P>z	Coef.	Std.Err.	P>z	Coef.	Std.Err.	P>z	Coef.	Std.Err.	P>z	Coef.	Std.Err.	P>z
assets_2000	0.00	0.00	0.64	0.00	0.00	0.57	0.00	0.00	0.47	0.00	0.00	0.81	-0.01	0.01	0.18
av_ebt/sales (98-00)	3.59	1.30	0.01	2.27	1.12	0.04	5.12	1.98	0.01	-2.10	1.25	0.09	-1.48	1.63	0.37
debt/assets_2000	-1.14	0.62	0.07	-0.28	0.39	0.48	0.16	0.34	0.64	-0.04	0.28	0.88	0.05	0.31	0.87
divest	-1.23	0.41	0.00	-0.66	0.47	0.16	-0.02	0.47	0.96	-0.11	0.55	0.84	-0.14	0.41	0.74
domest_inst_investor	0.09	0.36	0.81	0.85	0.32	0.01	-0.36	0.36	0.32	0.07	0.44	0.88	0.21	0.43	0.63
foreign_presence	-0.83	0.36	0.02	0.08	0.33	0.81	0.32	0.35	0.36	-0.12	0.41	0.77	-0.21	0.38	0.58
leading_bank	0.03	0.42	0.95	0.81	0.37	0.03	0.14	0.42	0.74	0.55	0.35	0.12	0.96	0.40	0.02
largest shareholder's share (omitted category: 0-24%):															
25-49%	-0.33	0.51	0.52	0.24	0.48	0.61	0.95	0.58	0.10	0.77	0.54	0.16	0.46	0.52	0.38
50-75%	-0.70	0.54	0.20	0.05	0.51	0.92	0.09	0.59	0.87	-0.69	0.69	0.32	-1.51	0.64	0.02
75-100%	-0.42	0.46	0.37	0.46	0.46	0.32	0.50	0.52	0.34	-0.51	0.46	0.27	-0.48	0.43	0.26
industrial sector (omitted category: heavy industry and mining):															
ind_labour_intensive	0.32	0.43	0.46	0.45	0.47	0.34	-1.70	0.62	0.01	-1.26	1.06	0.24	-0.35	0.87	0.69
ind_resource_intens	0.60	0.54	0.26	0.69	0.55	0.21	-0.81	0.57	0.16	-1.00	1.07	0.35	0.10	0.96	0.92
ind_services	1.37	0.68	0.04	1.46	1.15	0.21	-0.66	1.21	0.58	-8.82	1.13	0.00	-7.39	0.95	0.00
ind_med&high_tech	0.14	0.43	0.74	0.22	0.47	0.64	-1.15	0.56	0.04	-0.37	1.06	0.73	-0.17	0.89	0.85
poland	-0.79	0.35	0.02	-0.29	0.33	0.38	0.16	0.36	0.65	-0.25	0.46	0.58	-1.88	0.37	0.00
Number of observ	85			85			85			83			85		
Wald chi2	57			21			30			1410			1299		
Pseudo R2	0.148			0.057			0.148			0.112			0.171		

Notes: (i) Public equity finance: three variables for largest shareholder's shares are jointly significant at p=0.007; (ii) Coefficient significant at p<0.05 highlighted in bold.

Table 4. Further results of the ordered probit models (classical): determinants of public equity finance

	(1)			(2)			(3)			(4)		
		Robust			Robust			Robust			Robust	
Variables:	Coef.	Std.Err.	P>z									
assets_2000	0.00	0.00	0.607	0.00	0.00	0.740	0.00	0.00	0.972	0.00	0.00	0.925
av_ebt/sales (98-00)	-1.72	1.31	0.191	-2.13	1.24	0.087	-2.36	1.22	0.053	-2.20	1.19	0.066
debt/assets_2000	-0.05	0.28	0.872	-0.02	0.29	0.955	0.08	0.30	0.789	0.20	0.30	0.514
divest	-0.10	0.59	0.865	-0.09	0.55	0.872	0.03	0.48	0.953	0.08	0.50	0.870
domest_inst_investor	-0.04	0.36	0.901	0.02	0.37	0.957	0.05	0.37	0.886	-0.03	0.36	0.927
foreign_presence	-0.27	0.37	0.467	-0.14	0.41	0.728	0.03	0.36	0.939	0.03	0.36	0.941
leading_bank	0.58	0.34	0.090	0.55	0.35	0.116	0.40	0.36	0.269	0.30	0.35	0.396
largest shareholder's share (omitted category: 0-24%):												
25-49%	1.19	0.38	0.002	0.77	0.54	0.152						
50-100%				-0.55	0.47	0.244	-0.95	0.33	0.003			
linear										-0.01	0.00	0.013
industrial sector (omitted category: heavy industry and mining):												
ind_labour_intensive	-1.20	1.05	0.250	-1.26	1.07	0.241	-1.12	1.07	0.293	-0.82	1.06	0.436
ind_resource_intens	-1.06	1.05	0.314	-1.02	1.08	0.346	-0.83	1.07	0.438	-0.64	1.07	0.548
ind_services	-0.28	1.06	0.789	-0.38	1.08	0.727	-0.41	1.07	0.700	-0.25	1.06	0.810
ind_med&high_tech	-9.67	1.11	0.000	10.05	1.14	0.000	-9.36	1.12	0.000	-9.68	1.08	0.000
poland	-0.13	0.43	0.760	-0.24	0.46	0.610	-0.18	0.46	0.696	-0.03	0.44	0.954
Number of observ	83			83			83			83		
Wald chi2	1945			2152			1978			3142		
Pseudo R2	0.102			0.111			0.098			0.08		

Notes: (i) For specification (2): two variables for largest shareholder's shares are jointly significant at p=0.0027; (ii) Coefficient significant at p<0.05 highlighted in bold.