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Ultimate Ownership of Large Firms: Evidence from 30 European Countries

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Abstract

We have built a unique ultimate ownership dataset of both listed and unlisted large non-financial companies in the EU-28 Member States, Norway, and Switzerland in 2015. We have documented the major ultimate ownership structures. Our results demonstrate the irrelevance of the conventional taxonomy dividing the world into two categories – dispersed ownership in the US and UK, on the one hand, and concentrated ownership in Continental Europe, on the other. We have shown the rising importance of ultimate dispersed ownership (both widely held firms and widely held parent firms) in the largest non-financial firms in the EU Members States. We have tested various hypotheses about the determinants of ownership structure. Our dataset could be used for further evidence based policy making at both the EU level and the EU Member States.

I. Introduction

In the context of corporate governance reform in the EU over the last 25 years , two major policies could be outlined. The first is the policy for creating of the single product and capital markets in Europe, the second - the radical post-communist reform to liberalization and privatization in Eastern Europe. In both Western Europe (WE) and Central and Eastern Europe (CEE), the existing corporate governance models have been under pressure.

A great number of studies has been devoted to the agency problems of insiders and state, and their possible solution through trade and capital flow liberalization in both parts of Europe, and around the world.[1] The "insiders and the state" literature is not based on a monolithic theory but presents rather mixed bag of theories and methodologies. The main supposition of this literature is that liberalization of markets and privatization lead to creative distraction of the existing detrimental for performance ownership structures of both insiders (heir-controlled family firms, corporate managers and employees, banks (in the case of Germany) and the state and emergence of ownership structures like newly established private entrepreneurial firms, widely held companies and private firms in general, and hence better country and firm performance.

In CEE countries, empirical evidence shows that there has been a process of radical system change from state-centric corporate governance model to new models.[2] In WE countries, tentative results are presented about a process of eroding the labor-centric corporate governance model in Germany and the Scandinavian corporate governance model in Sweden.[3] . In Germany, in particular, it appears that large shareholders like the government and corporate insiders (e.g. banks, other financial institutions, labor) are losing ground. In Sweden, the big family owners are increasingly being challenged by the European integration. In both and other countries in Continental Europe, more open capital markets allowed an influx of institutional investors and growing role of the foreign owners.

However, there is no systematic evidence about the ownership patterns in different EU countries tracking recent ownership structures developments.[4] The conventional ownership taxonomy dividing the world into two categories – the U.S. and the U.K on the one hand and

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[1] See e.g. Hellwig (1999); Frydman and Rapaczynski (1993); Morck *et al* (2000).
[2] See e.g. **Peev (2002);** Nölke and Vliegenthart **(2009).**
[3] See e.g. Ringe (2015); Gelfer (2016); Sundqvist (2004).
[4] For example, La Porta *et al* (1999) examine ultimate ownership of a few countries in Western Europe in 1996; Faccio and Lang (2002) study ultimate ownership of 13 countries in Western Europe over the period 1996-99.

everyone else on the other – does not explain very much about the ownership structure of EU countries.

This paper asks two main questions: (1) What are the ultimate ownership structures in large firms in Europe? (2) What explains the differences between European countries in their ownership patterns? Our aim is to identify the relevant ownership patterns and their relevant agency problems which eventually could serve the evidence based policy making at the EU level and at the EU Member States. Thus, (1) we study ultimate ownership because direct ownership structure is not able to reveal the real chain of agency problems in firms and real decision-makers. (2) We focus on large firms because of their importance for both economics and politics of the EU Members States. (3) Our results are based on unique database with ownership information on both private and listed firms because we intend to examine the economically most important firms in any European country. (4) We examine the top 20 firms in any of all the EU-28 Member States, Norway and Switzerland but not top largest firms in Europe as a whole because the country policy makers are influenced from their local largest firms.

The previous research of ultimate ownership has mainly focused on listed firms and Western Europe.[5] Creating systematic knowledge about the actual most important ultimate beneficial ownership (UBO) in the EU-28 Member States, Norway, and Switzerland is one of the contributions of our paper. The second contribution is to identify the major country characteristics associated with the prevailing ownership patterns.

Our main findings are as follows. The observed most prevailing UBO categories are: state (36% of the sample), widely held parent company (21%), family (14%), and widely held company (12%). Domestic companies are 54% of the sample, foreign ones - 46%, and EU owners - 21%, and non-EU owners - 25%, respectively. These ownership structures are not monolithic neither in the EU nor within CEE (non-CEE) groups of countries, and vary by countries. Nevertheless, we might identify a few major ownership patterns. First, the rising importance of ultimate dispersed ownership (both widely held firms and widely held parent firms) in large firms in EU Members States. Second, institutional investors are most important in various ownership structures: (i) widely held companies where they are the largest minority direct owner (66% of the widely held

[5] Among a few exceptions, see e.g. Franks *et al* (2012). They examine both listed and unlisted firms in Germany, France, Italy, and UK in1996 and 2006.

firms), (ii) widely held parent companies where they are the largest minority ultimate owner (65% of companies), (iii) direct controlling shareholders. Third, surprisingly family firms are not so prevailing in the EU-28 countries but the state has still dominant position among the ownership categories.

The differences between ultimate ownership in CEE countries and WE countries are blurring. The deep penetration of ultimate owners from Germany and France in CEE countries, on the one hand, and the dominant share of US investors in Europe, on the other, have demonstrated the rising importance of cross-national dimensions of ownership structures and ownership integration in general.

The conventional taxonomy dividing the world into two categories – dispersed ownership in the US and UK, on the one hand, and concentrated ownership in Continental Europe, on the other, is not relevant in the EU context in 2015. The deeper cross-national ownership integration has blurred the boundaries between the common Anglo-Saxon – Continental Europe dichotomy at least for the ownership structures of large firms in the EU-28 Member States. About one third of large companies in the EU-28 have had agency problems similar to ones of the widely held companies in the US. Another one third are state-owned firms. In sum, the agency problems of both widely held companies and state firms should have been the most relevant starting point for evidence based policy analysis and discussion on corporate governance and law reforms in the EU.

Explaining the country differences among ownership patterns, we have found no support for the politics hypothesis as least using the OECD labor employment protection index. Second, there is a mild support for the shareholders protection hypothesis (using the shareholder protection index)only in widely held companies. Third, investor protection and stock market development are associated with more widely held companies. This is consistent with the predictions of law and finance literature On the other hand, it appears that country regulation and the quality of governmental institutions are less important for these companies compared to firms owned by ultimate widely held parents. Fourth, we present also tentative results about the interactions between openness and country governance, and their significant effects on more concentrated direct ownership structure only in countries with lower institutional quality. In countries with stronger governmental institutions, there is no effects of openness on the ownership concentration. Fifth, we observe interesting regional patterns on the effects of path dependency. The path dependency factors are weaker in CEE countries. One reason for this might be that privatization

and liberalization policies and reforms in post-communist transition were much more abrupt and radical than in countries in Western Europe.

Section II discusses our unique data set, which identifies the ultimate owners of the 20 largest non-financial companies in each of the 30 European countries. Section III presents the observed ultimate ownership structures. Section IV discusses the determinants of the main ownership structures. The results of our econometric analysis are presented in Section V. Conclusions are drawn in Section VI.

II. Data

The paper is based on unique dataset of ownership structures of the largest non-financial firms in 30 European countries (EU28 member states plus Norway and Switzerland). Our research and sample construction was aimed to contribute to the debate of who controls the largest companies in Europe. Prior studies have mostly studied listed companies (La Porta, Lopez-De-Silanes, Shleifer, (1999) and Faccio and Lang, 2002). However, closely held companies are very important in Western Europe and in Central and Eastern Europe, particularly. Some of them have considered or consider IPOs and might be listed within an expansion strategy to new markets. Our sample of companies was drawn from Bureau van Dijk's Amadeus database with ownership information as of November 26, 2015 and financial information up to year 2014. Size of companies is measured by assets, revenues or employees, or by a combination of these three indicators in a given year or time-span. Analysis of available data in Amadeus for the top 250 firms by each of the indicators in each of the years 2011, 2012, 2013 and 2014 for each country (a total of 20118 firms) suggested high volatility of ranks mostly because of missing data, but also due to errors and economic factors. If we have chosen to work with the available information for 2014 we would have missed 17% of companies in our sample. To offset for specific biases of Amadeus sources we rank the firms by the average total assets for years 2011 to 2014 and draw the top 20 for each country. Thus, we achieve higher validity and reliability of the top lists.

Even though it is claimed and believed that Amadeus contains non-financial firms only, our analysis suggested that there are various exceptions – i.e. financial firms, not-for-profit organisations and even public authorities. We first excluded financial firms by NACE codes 64**,

65** and 66**, but preserved 642* companies (activities of holding companies) for more detailed inspection. This included search for financial holdings but also for wrongly attributed NACE codes to companies with mostly financial, pension and investment management activities. We had to make up to 7 replacements per country (i.e. United Kingdom) of the initial top 20 firms by average assets for the period 2011-2014 to make sure we have only non-financial firms. Plausible explanations are wrong NACE codes, large legal diversity and primary sources of information and errors in processing data. About 10% of the initial sample have been replaced this way. Sector-wise our sample differs from the one of La Porta et al (1999) not only by allowing new sectors to appear through non-listed firms, but because by design they exclude utilities. This sector manifests quite different ownership patterns across Europe – wholly owned by the domestic state, wholly owned by a foreign state, wholly owned by families or other mixed ownership structures.

We looked for the web-sites of companies and their own descriptions of the major type of business in order to qualify for exclusion of the top ranking. In some cases even translating the name of entity from a non-widely used language (i.e. Hungarian) is informative enough, but we either followed the web-site (if available in Amadeus) or searched ourselves for it to make sure it is true. In several cases, NACE sector code was missing in Amadeus dataset and we had to attribute a two digit code based on the activity of the company, as evident from its web-site.

We start from the ownership information in BvD Amadeus with the cut-off being 20% of the shares to continue the search of ultimate beneficial owner (UBO). If the largest identified shareholder controls 20% or less, following the previous research on ultimate ownership, we call it *widely held company*. When we identify the largest shareholder, we look for its major shareholder and so on. If we identify dispersed ownership later in the ownership chain, the ultimate beneficial owner is coded as widely held parent. Scope and quality of ownership information in Amadeus varies significantly across countries. We have chosen 20% to achieve comparability with prior research on ultimate control in Europe (i.e. Porta, Lopez-De-Silanes, Shleifer (1999) and Faccio and Lang (2002) – for Western Europe and Gugler, Mueller and Peev (2013) for Central and Eastern Europe), although the lowest in-built definition of UBO in Amadeus is 25.01%. This limited the use of functionalities of Amadeus, but guaranteed higher validity and reliability of data, as we looked companies one by one.

We relied on the pre-defined ownership types in Amadeus database: employees/managers/directors, industrial company, bank, mutual &pension funds/nominee/trust/trustee, financial company, private equity fund, and foundation/research institute to inform our UBO type identification. We further investigated *industrial companies* type to check if they are another type of UBO. We distinguished between cooperatives (sometimes coded as an industrial company), financial, venture funds. As resulting number of UBO types in some categories was very small we aggregated non-bank financial companies into a new category (financial, private equity firms, venture capital companies) – *other financial*. Companies with identified UBO being employees/managers/directors, cooperative or foundation/research institute we code as *others*. The category *state* includes three level of government – central, regional (i.e. state in Austria or Germany) or local (i.e. cities).

As a rule, Amadeus database provides exact share of at least the largest shareholder, however even for the largest companies in EU-28, there were cases where even the largest shareholder could not be identified within Amadeus database (name, nationality and exact share). In some cases, owner non-identification is due to the fact that Amadeus links entities with an unique BvD identification number. However, in limited cases one and the same company might have two IDs in the database, mainly due to different time of entry, differences in name strings in primary sources and the like. In other cases, the shareholder was coded as an industrial company and in fact it was a public authority (government agency, municipality, etc.) or a financial company, which was not included in Amadeus. As we progressed with the ownership chain identification, the number of these cases increased and we had to look for alternative sources of information.

Additional sources of information included (in line of priority if multiple sources available): security and stock exchanges commissions (to identify the exact share of subsidiaries of listed companies, in cases we otherwise identified ownership link), firms' own web-sites and annual reports (including obvious parent companies identifiable by name), regulatory commissions (i.e. which would approve concentration activities and thus identify ultimate control of companies), Bloomberg, 4-traders and Morningstar web-sites, major international (Forbes, Financial Times, etc.) and national press (predominately for Central and Eastern Europe) in English and local languages, Wikipedia and other internet sources (usually identifying the

nationality of an owner, available by name in Amadeus dataset but with no data on his nationality). In cases, where we reached two or more shareholders with equal shares, we proceeded to identify their own corporate structures in order to identify the type of UB0 and its cash-flow rights). As Amadeus database has limited information on Russian companies (especially registered East of Ural), we had to rely primarily on external sources (including in Russian language). Most of the US companies appearing in ownership structures were either listed companies or their subsidiaries, disclosed either at their web-sites, stock exchange commission or aggregators of that data elsewhere.

Thus, the dataset of the identified top 600 firms in 30 European countries includes information on economic sector of activity, whether company is listed and ownership (name, type and share of capital) data upward to the ultimate beneficial owner. In seven cases, we were not able to go beyond certain industrial company through verified sources, however all information we found lead to us to believe that these are family controlled businesses. In three cases we had to estimate the share held by the UBO in the firm immediately preceding it (Russia, Estonia and Latvia), based on data published in different media.

Besides the company level data we have assembled various existing country-level indexes to explore the determinants of type of ultimate beneficial ownership. They include: Index of Economic Freedom of Heritage Foundation (2014); World Governance Indicators (1996-2014); OECD's Strictness of Employment Protection Indexes (since 1998 and since 2008 time-series); Cambridge Extended Shareholder Protection Index (1990-2013); the anti-self-dealing indicator in Djankov et al (2008), Takeover index – the number of attempted hostile takeovers as a percentage of traded companies between 2001 and 2006 (based on data from SDC Platinum), as reported in Franks, Mayer, Volpin and Wagner (2012), as well their aggregated index, which is equally-weighted sum of the last two indicators and stock market capitalisation as a share of GDP in 2006; Block Premium as percent of firm equity based on control transactions between 1990 and 2000 as estimated by Dyck and Zingales (2004) and various macro-indicators for year 2014 taken from the World Bank (GDP, population, number of listed companies, market capitalisation as a share of GDP, etc.).

To control for path dependence, we use prior studies by La Porta, Lopez-De-Silanes, Shleifer (1999), which identifies share of top 20 publicly traded firms around the world by type of

UBO (most of the data have a reference year being 1995 and 1996) and the most recent study using the same approach (top 20 countries, 20% cut-off) identifying ultimate state and foreign control of large European firms in 1996 and 2008, done by Gugler, Mueller and Peev (2013).

Table 1 provides summary statistics for the firms in our sample as average age, size (revenues and assets), ownership concentration and cash-flow rights, and the number of listed firms. The average age of companies in our sample of 600 companies is 30 years with the youngest being in Estonia, Greece, Poland, Spain and Bulgaria and the oldest being in Netherlands and Latvia (over 70 years). 31% of firms are listed on stock exchanges, varying from as low as 5% in Bulgaria, Slovak Republic, Malta and Luxembourg to as high as 80% in Germany. This result provides a solid argument why study of non-listed companies is needed when we want to understand who owns the largest companies in Europe and data from the previous research (e.g. La Porta et al , 1999) would not be enough even if replicated with newer data and wider coverage of countries. Size of companies varies significantly both across and within countries. The sample average assets for 2011-2014 are 23.6 billion euro and median being 7.2 billion euro. Expectedly, old EU member states (EU15) have much larger assets than new (EU13) with the ratio being close to 20 times bigger in the former group. Countries with relatively homogeneous firms by size are Ireland and United Kingdom (with a ratio between the maximum and minimum size in top20 being 4) and mostly heterogeneous firms are found in Croatia, Austria and Latvia (with the ratio of 16). While as a rule, listed companies have higher assets than non-listed firms in most of the countries, there are notable exceptions like Bulgaria, Latvia, Croatia and Slovak Republic, where listed companies tend to be smaller. The stock-markets in these countries are dominated by privatized firms, who decided to stay on the exchange, while others de-listed (as in the case of Bulgaria where many large privatized companies concentrated significantly ownership and then de-listed).

Countries differ significantly over the direct ownership concentration. In Spain, Germany and Finland the average share that the largest shareholder has in top20 firms is below 50%, while in Netherlands, Norway, Austria, Lithuania, Bulgaria, Malta and Luxembourg it is 90% and above. The split between the countries by the ratio of average cash-flow rights of the ultimate beneficial owner is again obvious – EU15 have lower levels, while EU13 have higher levels. The lowest average cash-flow rights have been observed in Ireland, United Kingdom, Luxembourg, Finland,

Spain and Belgium (less than 30%) and the highest in Latvia, Lithuania and Croatia (over 70%). There are two notable exceptions of this rule, Austria with 63% and Hungary with 38%.

Table 2 provides the sectoral distribution of firms in our sample. It includes firms in 59 NACE two-digit code sectors in the 30 European countries. Three sectors attract 46% of the top firms. Holding companies account for 16% of the sample, activities of head-offices and management consultancy account for another 16% and 13% are found in electricity, gas, and air conditioning supply. The only other sector that attracts more than 5% of firms is telecommunications. A total of 15 NACE two-digit code sectors attract at least 1.5% of the sample in each of them and a total of 81% of all firms. We use these sectors (described in the annex) as a proxy to control for sector effects in our models.

Table 3 presents the relative share of assets controlled by the same UBO. Most often – 36% of the largest top 20 firms in EU30 countries are owned by the state, but this corresponds to 22% of the assets in the sample. One fifth of the companies are owed indirectly by a widely-held parent company, corresponding to 26% of assets in the sample. Widely held companies in the sample are 12.3%, but controlling relatively bigger share of the assets in the sample -22.15%. Family firms represent 15.5 % of the sample firms and 15% of the sample assets.

III. Ultimate Ownership Structures By Countries

1. Ultimate Ownership Categories

Table 4 reports the major UBO categories by (i) countries, (ii) domestic/foreign affiliation, and (iii) within the group of foreign owners - EU and non-EU owners. The observed most prevailing UBO categories are as follows: state (36% of the sample), widely held parent company (21%), family (14%), and widely held company (12%). Domestic companies are 54% of the sample, foreign ones - 46%, and EU owners - 21%, and non-EU owners - 25%, respectively.

In Continental Europe, *widely held companies* are more typical in Scandinavian countries (Denmark (35%), Finland (55%), and Sweden (45%) as well as Western Europe (Germany (35%), Belgian (40%), France (40%), Netherlands (65%), Spain (45%), Switzerland (50%). The subject of major interest of the law and finance literature, the large public company with dispersed ownership, is a prevailing UBO in Germany, France, Spain, and Finland, having 35 % share of the 20 top large companies in each of these countries. Obviously, following solely the predictions of

the law and finance literature one cannot explain the developments of dispersed ownership in these countries by German, French, and Scandinavian legal origin.[6]

The *widely held parent companies* are typical UBOs in: Netherlands (60%), Belgian (40%), Czech Republic (30%), Hungary (40%), and Sweden (30%).

The *domestic family firms* are relatively more important in Germany (20%), France (25%), and Portugal (35%).

The *state* is the dominant owner in most countries in Central and Eastern Europe as well as Austria (40%), Italy (50%), France (35%), Greece (55%), and Norway (55%). For the former, one might speculate that this pattern is a legacy from the communist past. Following this speculation, we shall formulate a hypothesis in the next section and test it in Section V.[7]

In sum, our data reveals that the observed ownership patterns are not monolithic neither in the EU nor within CEE (non-CEE) groups of countries, and vary by countries. Nevertheless, we might identify a few major ownership patterns.

First, the rising importance of ultimate dispersed ownership (both widely held firms and widely held parent firms) in large firms in EU Members States. At the level of the EU, the ultimate dispersed ownership structure is the second important UBO category (33% of all the firms) after the state (36% of the firms). The real presence of the ultimate dispersed ownership is even more impressive when measured by the total assets. As Table 3 shows and we have already discussed above, both widely held and widely held parent companies control more than two-third of the total assets of the large companies in the EU.

Second, institutional investors are most important in various ownership structures: (i) widely held companies where they are the largest minority direct owner (66% of the widely held firms), (ii) widely held parent companies where they are the largest minority ultimate owner (65% of companies), (iii) direct controlling shareholders.

Third, surprisingly family firms are not so prevailing in the EU-28 countries (only 14% of the firms) but the state has still dominant position among the ownership categories. Thus, we document a systematic picture for the decreasing role of the domestic family owned firms in the large firms in all the EU-28 Member States. Families and individuals like institutional investors participate in various owner roles: (i) controlling owners; (ii) largest minority owners in widely

[6] For the predictions of law and finance literature, see Hypothesis 3a in Section IV.
[7] See Hypothesis 6 in Section IV.

held companies ; (iii) widely held parent companies where they are the largest minority owner add%

IV. Hypotheses

Contrary to the conventional view for the dominant role of the families in the non-state largest companies in Europe, our study reveals that the *widely held companies* (firms with the largest *direct minority* owners- institutional investors (65%), the rest: families and the state) and *affiliates of widely held parent companies* (firms with *ultimate minority* owners - institutional investors (65%), the rest: families and the state) are economically most important large firms in the EU-28 Member States.

In this section, we apply an eclectic approach and briefly focus to various theories explaining the relevant most prevailing ownership structures of large companies in the EU Member States.

1. Company Age

The life cycle theory of the firm claims that firms evolve over time from family-owned into widely held companies (Mueller, 1972). Thus, family control should be negatively associated with firm age.[8] Our measure of firm age is based on provided registration date by BvD Amadeus.[9]

Hypothesis 1. Firm age is (1) negatively associated with family control and (2) positively associated with widely held firms.

2. Liberalization of Markets in the EU

Morck *et al* (2000) show that trade and capital flow liberalization appear to level the playing field between heir-controlled, entrepreneur-controlled, and widely held Canadian firms. They consider an event that suddenly and unexpectedly rendered Canada more open to foreign capital and less protected by entry barriers, the 1988 Canada-US. Free Trade Agreement (FTA). The authors have specified several ways in which the FTA could have affected the relative standing

[8] The main subject of this paper are not family firms but rather the ownership diversity in the EU. Thus, we do not delve more into the issues of family ownership evolution. For more nuanced hypotheses on the determinants of family ownership, see e.g. Franks *et al* (2012).

[9] All the variable definitions are presented in the Appendix.

of heir-controlled family firms. First, heightened product market competition could have reduced the value of poorly managed firms. Second, a greater inflow of U.S**.** capital to Canadian entrepreneurs could reduce heir-controlled firms' market power over the supply capital. Third, U.S. firms active in Canada might raise capital there, creating more competition for Canadian savings and eroding entrenched players' market power on that side of the capital market as well. Thus, the liberalization stemming from the Canada-U.S. Free Trade Agreement increased both product and capital market competition in Canada. Heir-controlled firms' inability to compete in this harsher environment is exposed in their negative stock-price reactions to the FTA. The value discount that outsiders attached to heir control rose in the years following the FTA, the firms of departing entrepreneurs tend to become widely held rather than heir controlled, again consistent with a large value discount connected with heir control. Morck *et al* (2000) suggest, that liberalization in international trade and capital flow renders product and capital markets more competitive and thereby raise the price that families must pay to maintain inherited corporate control. The authors document that the implementation of the FTA lead to increasing the fraction of firms that are either widely held or owned by a widely held parent from 27.24 percent in 1988 to 32.11 percent in 1996.

Franks *et al* (2012) show that more *foreign ownership* is a direct indicator of the greater degree of openness of the market for corporate control in the U.K. compared to Continental Europe. They report that foreign blockholders are much more common in the U.K. than in Continental Europe: 35% of all U.K. firms have a foreign blockholder compared to between 18% and 21% in Germany, France, and Italy.

We measure openness as the share of trade (export and import) of GDP.

Hypothesis 2. Openness of economy (trade liberalization) is (1) negatively associated with family control and (2) positively associated with dispersed ownership.

3. Country Factors Explaining Concentrated Ownership Patterns

3.1.Investor Protection

La Porta *et al* (1997,1998) argue that Bearle and Means widely held corporation should be more common in countries with good legal protection of minority shareholders. First, in these countries, controlling shareholders have less fear of being expropriated themselves in the event that they ever lose control through market for corporate control markets and so might be willing

to cut their ownership of voting rights by selling shares to raise funds or to diversify. Second, in contrast, in countries with poor protection of minority shareholders, losing control involuntarily and thus becoming a minority shareholder may be such a costly proposition in terms of surrendering the private benefits of control that the controlling shareholders would do everything to keep control. They would hold more voting rights themselves and would have less interest is selling shares in the market. The law and finance literature was partly used in the European Commission proposals for reform of corporate governance systems in the EU applying the legal transplant approach.[10]

In countries with weak investor protection, widely held companies are subject to severe agency problems between managers and shareholders, which large blockholders can overcome because of their greater incentives to monitor managers. Thus, concentrated family ownership emerges as a solution to agency problems in countries with weak investor protection. The law and finance view therefore predicts that family firms will be more presented in countries with weak investor protection.

We use two measures of investor protection: the anti-self-dealing index (Djankov *et al* , 2008) and the shareholder protection index (Siems, M.(ed) , 2016).

Hypothesis 3a. The higher a country's shareholders protection, (1) the more firms are with dispersed ownership (widely held companies), and (2) less are firms under family control.

3.2.*Politics*

Mark Roe (2000, 2003) offers an alternative explanation for the differences in ownership structures between Europe and the United States to that of La Porta **et**. Roe questions the legal origin explanation and argues that the differences lay in their politics and not in their legal systems. Where labor, through politics, has stronger protection, capital must concentrate to respond effectively. Those people who do own common equity in social democracies prefer large blocks, which offer them some protection against corporate insiders opportunistic behavior. Mark Roe identified social democratic politics as the driving force toward ownership concentration.

We use as a proxy for the country labor protection the OECD Employment protection index.

[10] Berkowitz et al (2003).

Hypothesis 3b. The higher a country's labor protection, the less firms are with dispersed ownership (widely held companies).

3.3. Refining controlling shareholders – dispersed ownership taxonomy

Gilson (2006) presents a critical view on the controlling versus widely held distinction. He argues that because controlling shareholders must bear liquidity and non-diversification costs from holding a concentrated position as well as the direct costs of monitoring, some private benefits of control likely are necessary to induce a party to play that role. Thus, from the public shareholders viewpoint, the two elements of the corporate agency problem present a tradeoff. Public shareholders will prefer a controlling shareholder as long as the benefits from reduction in managerial agency costs exceed the private benefits that the controlling shareholder will extract. The central implication of the controlling shareholder tradeoff framework is that the fact that a country has a controlling shareholder governance system is too general an observation to tell us very much.

Thus, the national pattern of concentrated control of publicly traded corporations can be consistent with two very different equilibria. First, the ownership pattern reflects a structure of *inefficient* controlling shareholders, where because of bad law the cost of private benefits exceeds the benefits of more concentrated monitoring of managers – minority shareholders are net worse off from the controlling shareholder's monitoring effort. Second, the ownership pattern reflects a structure of *efficient* controlling shareholders, where because of good law the benefits of more concentrated monitoring exceeds the cost of private benefits and the value of minority shares increases as a result.

In an efficient controlling shareholder system, concentration of control operates as a cost effective response to the managerial agency cost problem. It is observed when the benefits of more focused monitoring exceed the limited extraction of private benefits of control allowed in a country with functionally good law. This represents a form of *functional convergence* – within limits, different corporate governance systems may solve the same monitoring problem through different institutions.[11]

[11] Gilson (1996; 2001).

Gilson (2006) argues that from this perspective, the U.S. and Sweden no longer fall on opposite sides of a widely held/ controlling shareholder dichotomy, but are points on a single functionally good law continuum, with the placement of a jurisdiction at a particular point in time reflecting the particular history of the jurisdiction and the company, and the current dynamics of industrial organization and capital markets. He claims that while it is relatively easy to describe the requirements of good law in this broader functional sense, it is much more difficult to test empirically other than through simple backward induction – countries with low private benefits of control must have functionally good law.

We use the control block premium as a proxy for the country's private benefits of control (Dyck and Zingales , 2004).

Hypothesis 3c. The higher country's private benefits of control, the less firms are with dispersed ownership (widely held companies).

4. Other Country Factors

4.1.Country Governance

Paul Mahoney (2001) argues that it is not the protection common law systems provides to *shareholders* that explains their superior economic performance but rather the protection they offer to the *citizens* of these countries. By providing stronger protection of property rights, common law systems protect citizens from the arbitrary expropriations of property that could occur in civil law systems. This property rights protection provides greater incentives to start businesses, enter into contracts, make investments and the like. Both law and finance and this hypotheses are not mutually inconsistent. Common law systems may offer both greater shareholder protection and better enforcement of property rights. Indeed, Paul Mahoney (2001) has made just such a claim.

We use two measures of the country governance: Worldwide Governance Indicators (WGI) and OECD Product market regulation index.

Hypothesis 4a. The better the quality of governmental institutions, the more firms are with (1) with dispersed ownership (widely held companies) and (2) indirect dispersed ownership (widely held parent companies).

Hypothesis 4b. The higher a country's regulation burden, the less firms are with (1) dispersed ownership (widely held companies) and (2) indirect dispersed ownership (widely held parent companies).

5. Financial Development

Recent studies focus on the influence of the degree of financial development and the liquidity of financial markets on the ownership structure. Studies show that greater financial development leads to higher liquidity of financial markets and increasing the incentives for controlling families to sell equity, thus increasing the share of widely-held companies.[12]

We follow the previous studies and use as measures of the financial development stock market capitalization and the number of listed companies.

Hypothesis 5. The higher a country's stock market development, the more firms are with dispersed ownership (widely held companies).

6. Path Dependency

According to the law and finance view, the existence of good law gives rise to widely-held and efficient controlling shareholder systems. According to the path dependent view, the direction of causation is reversed, initial conditions giving rise to a shareholding pattern that then demands good law. Gilson argues that in Sweden, once politics allowed the leading families to lock in control, a demand arose to assure that the locked in controllers did not steal. The Swedish case is consistent with Mark Roe's political theory; in the U.K., it is not. Thus, politics characterizes the initial conditions in some countries, but not in others. Every country's initial conditions may be unique even if the ownership outcomes converge to one of a few patterns.[13]

We use the share of dispersed and state ownership in 1996 as a proxy for initial ownership structures in the country.

Hypothesis 6. The state (dispersed) ownership in 1996 is positively associated with the state (dispersed) ownership in 2015.

V. Explaining the Ultimate Ownership Patterns

[12] For example, Helwege, Pirinsky, and Stulz (2007) report that firms with more liquid stocks tend to become widely held more quickly in the US.

[13] See e.g. Bebchuk and Roe (1999).

The interactions among the country openness, financial development, and governance discussed in the previous section are complex.

Openness and financial development

Rajan and Zingales (2003) propose an interest group theory of financial development where incumbents oppose financial development because it breeds competition. The theory predicts that incumbents' opposition will be weaker when an economy allows both cross-border trade and capital flows. The authors argue and find evidence that in periods of high capital mobility, countries that conduct a lot of foreign trade are also likely to have well-developed capital markets. Countries that conduct little trade are unlikely to have developed capital markets.

In our data, the correlation coefficient between openness and stock market capitalization in 2006 is small (0.20) and significant of 1%, and between openness and stock market capitalization in 2014 is insignificant. In our econometric modeling below, we treat the effects of trade and stock market development separately.

Openness and country governance

How do both economic liberalization and country governance affect establishment of private firm *de novo*, listed firms, and other ownership changes? Economic liberalization likely does not have the same impact in every country. For example, the firm growth effect should depend on two factors: how much additional investment the liberalization generates (e.g., because the decreasing cost of finance) and the returns on new investments.[14] Countries with a relatively efficient financial markets (better access to external finance) and good governance *ceteris paribus* might see higher returns on investment and a large firm growth. For example, Acemoglu *et al*. (2003) argue that the quality of political institutions played an important role in how European countries took advantage of Atlantic trade and were propelled to higher growth. On the other hand, countries with relatively bad governance and inefficient capital markets could experience a large drop in the cost of finance and generate larger firm growth (e.g. communist countries in Eastern Europe in 1950s.) In sum, the sign of the joint effect of economic liberalization and country governance on firm growth are *ex ante* unclear and is an open empirical question.

[14] This discussion is built on Peev (2015).

Are the decisions for economic liberalization of markets in the EU in the 1980s and in Eastern Europe after the sudden collapse of communism at the end of 1989 exogenous decisions? As some authors observe addressing endogeneity concerns is difficult because finding a suitable instrument for liberalization is nearly impossible.[15]

In this paper, we are confident that reverse causality is not an issue, since we measure openness during the 18 years *before* we observe ownership structure (this is also true for the other explanatory variables: we measure country governance during the 18 years before we observe ownership structure, stock market capitalization –the 8 years before, shareholders protection the 23 years before, labor protection – the 6 years before). Second, the methodology of measurement of country indexes is independent from our methodology of identification of ultimate ownership structures.

Table 5 presents the correlations between the basic explanatory variables and the main ownership categories. The presence of *widely held firms* is significantly positively correlated with the firm age, size, the development of country's stock market, the quality of country governance, and investors protection (the shareholder protection index has higher coefficient than the anti-self dealing index), and negatively with openness of economy. The latter observation is surprising and will be discussed in our hypotheses testing part of this section below in detail. The correlation between labor protection index and dispersed ownership is negative and significant at 10% level. The correlation coefficient between company assets and governance index is 0.60, and it is positive and significant (not reported in the table). This creates a multicollinearity problem when using both variables in the regressions.

Company ownership by *widely held parent firms* is significantly positively associated with better country's institutions, less regulation burden, more openness, and negatively with more labor protection and company age.

The *domestic family* ownership is positively correlated to firm age and as expected negatively to the openness, and positively correlated to the labor protection index.

[15] Bekaert *et al*. (2005).

Foreign control is highly correlated with country's openness and the quality of country governmental institutions.

Table 5 reports as well as correlations between selected type of ownership control of firms and selected sector dummies. Foreign companies significantly more open invest in telecommunications and wholesale trade. In the later sector, expectedly invest widely held parent companies. State companies as ultimate beneficial owners are found more often to own utility companies and those engaged in land transportation (railways) and warehousing and support activities to transport, compared to other type of owners. Family companies are more often found in manufacture of motor vehicles sector, valid for most of the automotive companies in Europe. Firms with widely held parent have been significantly more often associated with manufacturing of pharmaceutical products, compared to other type of owners.

We test the hypotheses discussed in the previous section applying a probit model. Our first specification uses a maximum likelihood probit model with cluster (countries) standard errors. This model fits our specification with a dichotomous dependent variable. The dependent variable takes the value 1 if the firm is classified under one of the five main ultimate ownership categories (family, widely held, widely held parent, state, foreign) and 0 otherwise. In all regressions, family control means domestic family control. Since the unit of observation is a firm, but we include country observations (i.e. the governance index, openness, labor protection), we use repeated observations and the requirement that observations are independent is violated. If we would not account for the induced correlation within each country, we would get standard errors which are biased downward. Thus, we use a robust variance estimator based on country clustering, i.e. standard errors that allow for intra-country correlation. This does not reduce the number of observations but only places restrictions on the variance covariance matrix. Our second specification fits a random-effects probit model. We chose the random effects model because unconditional fixed-effects probit models are biased. The estimates using the second specification are similar. Thus, we do not report them in order to save space but they are available from the authors by request.

Table 6 reports the results of testing Hypotheses 1 and 2. On the left-hand side of Table 6 (equation 1), the dependent variable takes the value one if a company was ultimately family-controlled in 2015 and zero otherwise. The coefficient on the company age is statistically

significant but with a wrong positive sign. Older firms are more likely to be family controlled. This is in odds with Hypothesis 1 based on the life cycle theory of the firm predicting older firms to relinquish family control and become widely held companies. Franks et al (2012) reports similar results as ours for family firms in Germany, France, and Italy but not in the UK. They explain their results with factors interacting with firm age like investors protection, development of stock market, and the market for corporate control which they claim are better in the UK than in Continental Europe.

In Equation (2), the dependent variable takes the value one if a company was widely held in 2015 and zero otherwise. The coefficient on the company age is as expected positive and statistically significant. Thus, we have found mild support for Hypothesis 1 on firm age as a determinant of the observed domestic family ownership structures in the EU-28 countries.

Turning to the right-hand-side of Table 6, we test Hypothesis 2 on the effects of trade liberalization and openness on ownership structures. The coefficients on the openness variable are of the predicted sign for family firms (negative), widely held parent companies and foreign firms (positive), and all three are statistically significant. In contrast with these coefficients, however, the coefficient on the openness variable does not corroborate the Hypothesis 2. More openness is associated with less widely held firms.

Following our discussion on Gilson (2006), we separate our data into two sub-samples: countries with "good governance" (governance index bigger than the mean governance) and countries with "bad governance" (governance index smaller than the mean governance).[16] I ran separate probit models for widely held companies and firms with ultimate owners widely held parent companies. In the sample of countries with "good governance", coefficients of both types of firms are insignificant, but in the sample of countries with "bad governance" the coefficient on widely held companies is *negative* and significant , while the coefficient on firms with ultimate owners widely held parent companies is *positive* and significant. It appears that openness has no effect on ownership concentration in countries with strong institutional quality (these countries could develop firms with both dispersed and controlling shareholders ownership structures). However, in the other sample – countries with low institutional quality, the lack of efficient

[16] The results are note reported in a separate table and are available from the authors by request.

external mechanisms requires more concentrated ownership structures and eventually internal control becomes more important. These finding are corroborating the Gilson's supposition presented in the previous section. Most countries with lower governmental institutional quality in our sample are countries in CEE. Thus, further research is needed to identify if other regional factors play explanatory role in this case.

Table 7a presents the results of testing Hypotheses 3a-3c for widely held companies. Equations (1) and (2) report the results using as a proxy for investor protection anti-self dealing index and shareholder protection index, respectively (Hypothesis 3a). Only coefficients on the shareholder protection index are significant. The equation (3) reports the results on the effects of employment protection index (Hypothesis 3b)**.** The coefficients have the predicted negative signs but are insignificant. Looking at the coefficients on the left-hand-side of Table 9, we see that they confirm the hypothesis about the negative effects of block premium on the presence of widely held firms (Hypothesis 3c).

Table 7b presents the results of testing Hypotheses 3a-3c for firms with ultimate owners - widely held parent companies. The most coefficients are insignificant. The coefficients on the employment protection index the predicted negative signs but are significant only on the random effects model.

Summarizing, we have found no support for the politics hypothesis as least using the OECD labor employment protection index. There is a mild support for the shareholders protection hypothesis (using the shareholder protection index)only in widely held companies. The hypothesis on the effects of private benefits of control was corroborated as well as only in widely held companies.

In Table 8, we report the results using both governance index as a proxy for the quality of the governmental institutions and regulation index and testing their effects on ownership structures (Hypothesis 4a and Hypothesis 4b). In equations (1) and (2), the coefficients on the governance index are positive and significant in explaining widely held parent ownership but insignificant in explaining widely held companies.

Turning to the right-hand-side of Table 8, the equation (3) presents the results of testing of the effects of regulation burden proxied by the OECD regulation index on ownership types. All

the coefficients are significant but with the predicted sign only for the firms with ultimate owners - widely held parent firms. Thus, Hypothesis 4a and Hypothesis 4b have got a rather relatively strong support in our estimates for the widely held parent companies.

Table 9 presents the results of testing Hypothesis 5 for the effects of stock market development proxied by three variables (stock market capitalization in 2006, stock market capitalization in 2014, and the number of listed companies in 2014). The most coefficients are significant and with the predicted positive sign only of the widely held companies.

Finally, Table 10 presents the results of testing Hypothesis 6 on the effects of initial ownership structures. We observe interesting regional patterns. Both coefficients on state and widely held variables are significant and positive in firms in Western Europe. In contrast with the coefficients observed in Western Europe, however, in CEE countries the coefficient on the state variable in 1996 is insignificant as explanatory variable in explaining state control in 2015. One reason why the path dependency factors are weaker in CEE countries might be that privatization and liberalization policies and reforms in post-communist transition were much more abrupt and radical than in countries in Western Europe.

Summarizing, we might outline important differences between the effects of country indexes on ultimate ownership structures. Investors protection and stock market development are associated with more widely held companies. This is consistent with the predictions of law and finance literature On the other hand, it appears that country regulation and the quality of governmental institutions are less important for these companies compared to firms owned by ultimate widely held parents. The employment protection has negative but insignificant effects on both ownership categories. We present also tentative results about the interactions between openness and country governance, and their significant effects on more concentrated direct ownership structure only in countries with lower institutional quality. In countries with stronger governmental institutions, there is no effects of openness on the ownership concentration.

VI. Conclusions

We have documented the major ultimate ownership structures of top 20 non-financial large firms in 30 European countries in 2015. Our results demonstrate the irrelevance of the conventional taxonomy dividing the world into two categories – dispersed ownership in the US and UK, on the

one hand, and concentrated ownership in Continental Europe, on the other. We have shown the rising importance of ultimate dispersed ownership (both widely held firms and widely held parent firms) in the largest non-financial firms in the EU Members States. We have constructed a unique dataset that could be used for further evidence based policy making at both the EU level and the EU Member States.

Appendix

List of variables

Domestic family – a dummy variable, which takes the value of 1 if a firm is under a direct or in-direct family control and 0 otherwise.

Widely held - a dummy variable, which takes the value of 1 if firm's largest shareholder controls 20% or less of the shares and 0 otherwise.

Widely held parent - a dummy variable, which takes the value of 1 if a firm's ultimate controlling company is widely held.

State - a dummy variable, which takes the value of 1 if a firm is under a direct or in-direct state control and 0 otherwise. State includes all three layers of government – central, regional and local.

Foreign - a dummy variable, which takes the value of 1 if a firm is under control of a foreign company or, if under control of a widely-held company, its largest shareholder is a foreign company, and 0 otherwise.

Age – firm age based on provided registration date by BvD Amadeus. Age calculated as of 2015.

LN (assets) – Natural logarithm of average assets in the period 2011 – 2014. Data from BvD Amadeus.

Anti-self-dealing index – The index measures legal protection of minority shareholders against expropriation by corporate insiders. Source: Djankov et al (2008).

Block premium - percent of firm equity based on control transactions between 1990 and 2000. Source: Dyck and Zingales (2004).

Employment protection – Strictness of employment protection index. Average for years 2008-2014. We use the thirteen-component version of the index. Source: OECD

Governance Index - the average of the six Worldwide Governance Indicators (WGI): voice and accountability, government effectiveness, rule of law, regulatory quality, absence of corruption, and political stability. The index is an average of indexes from 1996 to 2014. There are no indexes for 1997, 1999 and 2001 and they are estimated as average of the preceding and next year (1996 and 1998, 1998 and 2000 and 2000 and 2002). Source: World Bank.

Market capitalisation 2014 – Market capitalization of listed companies on the domestic(s) stock exchanges as a share of GDP. Source: World Bank.

Market capitalisation 2006 – Market capitalization of listed companies on the domestic(s) stock exchanges as a share of GDP. Source: Franks et all (2012).

Number of listed firms – number of listed companies in a given country in 2014. Source: World Bank.

Openness – Share of trade (export and import) of GDP. Indicator is an average for the years 1996, 2008 and 2011 to 2014. Source: World Bank.

Regulation index: Product market regulation index. Reference year: 2013. Source: OECD.

State firms in WE 1996 - Share of top20 listed firms, which are under state control. Source: La Porta et all (1999).

State firms in CEE 1996 - Share of top20 listed firms, which are under state control. Source: Gugler, Mueller, Peev (2013).

Shareholder protection index – an expert assessment on shareholder protection in 30 countries for the period 1990-2013. Source: CBR Extended Shareholder Protection Index. Version of January 2016. Centre for Business Research, University of Cambridge.

Widely held firms in 1996 – Share of top20 listed firms, which are widely held in 1996. Source: La Porta et all (1999).

nace1 – Dummy variable, which takes the value of 1 if firm is in sector Extraction of crude petroleum and natural gas and 0 otherwise.

nace2 - Dummy variable, which takes the value of 1 if firm is in sector Manufacture of coke and refined petroleum products and 0 otherwise.

nace3 - Dummy variable, which takes the value of 1 if firm is in sector Manufacture of basic pharmaceutical products and pharmaceutical preparations and 0 otherwise.

nace4 - Dummy variable, which takes the value of 1 if firm is in sector Manufacture of motor vehicles, trailers and semi-trailers and 0 otherwise.

nace5 - Dummy variable, which takes the value of 1 if firm is in sector Electricity, gas, steam and air conditioning supply and 0 otherwise.

nace6 - Dummy variable, which takes the value of 1 if firm is in sector Civil engineering and 0 otherwise.

nace7 - Dummy variable, which takes the value of 1 if firm is in sector Wholesale trade, except of motor vehicles and motorcycles and 0 otherwise.

nace8 - Dummy variable, which takes the value of 1 if firm is in sector Retail trade, except of motor vehicles and motorcycles and 0 otherwise.

nace9 - Dummy variable, which takes the value of 1 if firm is in sector Land transport and transport via pipelines and 0 otherwise.

nace10 - Dummy variable, which takes the value of 1 if firm is in sector Warehousing and support activities for transportation and 0 otherwise.

nace11 - Dummy variable, which takes the value of 1 if firm is in sector Telecommunications and 0 otherwise.

nace12 - Dummy variable, which takes the value of 1 if firm is in sector Activities of Holding companies and 0 otherwise.

nace13 - Dummy variable, which takes the value of 1 if firm is in sector Real estate activities and 0 otherwise.

nace14 - Dummy variable, which takes the value of 1 if firm is in sector Activities of head offices; management consultancy activities and 0 otherwise.

nace15 - Dummy variable, which takes the value of 1 if firm is in sector Office administrative, office support and other business support activities and 0 otherwise.

naceother – Dummy variable, which takes the value of 1 if firm is in all other NACE sectors and 0 otherwise.

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Table 1. Summary Statistics

	Firms	Listed firms	Assets (Average)	Assets (Mimimum)	Assets (Maximum)	Assets (Median)	Revenues (Average)	Average cash-flow of UBO	Ownership concentration	Firm Age
	No	No	in million euro (2011-2014)					Percent	Percent	Years
Austria	20	3	26,200	8,660	146,649	18,886	18,660	63%	90%	17
Belgium	20	3	23,774	10,750	59,234	19,461	6,318	30%	83%	14
Bulgaria	20	1	1,045	474	3,248	781	668	69%	93%	14
Croatia	20	5	2,207	476	9,339	1,427	769	75%	87%	27
Cyprus	20	3	3,034	1,412	7,374	2,366	1,750	36%	78%	52
Czech Republic	20	3	3,812	1,626	23,625	2,530	2,482	50%	89%	34
Denmark	20	6	11,781	4,284	55,379	6,809	6,591	50%	77%	17
Estonia	20	3	504	200	2,023	316	211	56%	81%	11
Finland	20	13	8,301	3,350	28,102	5,348	6,661	26%	45%	48
France	20	13	88,726	42,119	250,239	61,001	46,691	45%	52%	18
Germany	20	16	80,568	32,252	309,708	54,305	64,085	39%	42%	23
Greece	20	11	4,529	1,472	16,472	2,815	2,296	48%	57%	11
Hungary	20	3	5,024	2,008	15,708	3,842	2,467	38%	86%	45
Ireland	20	9	12,545	7,113	21,250	11,413	9,868	15%	55%	27
Italy	20	10	47,393	13,990	171,201	26,532	18,359	43%	64%	48
Latvia	20	3	589	211	3,451	343	251	73%	82%	72
Lithuania	20	6	735	269	1,880	540	582	78%	92%	15
Luxemburg	20	1	26,024	12,095	54,631	20,503	370	25%	93%	41
Malta	20	1	2,021	743	8,791	1,332	2,242	54%	92%	18
Netherlands	20	4	71,214	32,522	324,856	49,779	32,402	30%	90%	74
Norway	20	4	27,529	7,543	105,217	16,953	15,835	40%	90%	44
Poland	20	11	5,898	2,590	14,427	4,390	4,373	54%	69%	12
Portugal	20	5	7,065	3,520	20,447	4,975	1,706	38%	74%	34
Romania	20	6	2,419	940	8,646	1,386	1,057	66%	79%	33
Slovak Republic	20	1	2,517	951	7,578	1,805	1,576	59%	88%	35
Slovenia	20	6	1,084	383	5,589	652	634	68%	77%	25
Spain	20	13	37,636	17,275	125,139	25,152	17,535	28%	41%	12
Sweden	20	8	17,939	9,741	57,046	12,140	10,056	32%	61%	30
Switzerland	20	10	39,031	9,354	101,795	27,262	27,733	36%	54%	23
United Kingdom	20	6	147,703	73,337	285,920	143,501	129,965	22%	74%	41
Total	600	187	23,628	200	324,856	7,169	12,101	46%	74%	30

Note: Variable definitions are presented in the Appendix.

Table 2 Distribution of Firms by Industry

Code	Sector name	Variable name	Percent
06	Extraction of crude petroleum and natural gas	nace1	1.67%
19	Manufacture of coke and refined petroleum products	nace2	2.83%
21	Manufacture of basic pharmaceutical products and pharmaceutical preparations	nace3	2.17%
29	Manufacture of motor vehicles, trailers and semi-trailers	nace4	2.33%
35	Electricity, gas, steam and air conditioning supply	nace5	13%
42	Civil engineering	nace6	1.67%
46	Wholesale trade, except of motor vehicles and motorcycles	nace7	3.5%
47	Retail trade, except of motor vehicles and motorcycles	nace8	2.17%
49	Land transport and transport via pipelines	nace9	3%
52	Warehousing and support activities for transportation	nace10	4.33%
61	Telecommunications	nace11	5.17%
642	Activities of Holding companies	nace12	16.33%
68	Real estate activities	nace13	1.67%
70	Activities of head offices; management consultancy activities	nace14	16.33%
82	Office administrative, office support and other business support activities	nace15	4.67%
	Other	naceother	19.17%

Note: Variable definitions are presented in the Appendix.

Table 3. Assets by Ultimate Ownership

Type	Share in sample
Widely held parent	26.21%
Widely held	22.15%
State	22.46%
Family	15.04%
Bank	5.54%
Mutual, Pension Fund and Trust Funds	1.27%
Other financial	2.11%
Others	5.22%

Note: Variable definitions are presented in the Appendix.

Table 4. Ultimate Ownership Categories by Countries

	Family	Bank	Mutual, Pension and Trust Fund	Other financial	Others	State	Widely held	Widely held parent	Total
Austria	0.1		0.1	0.05	0.1	0.4	0.05	0.2	1
Belgium					0.2	0.3	0.1	0.4	1
Bulgaria	0.05			0.15	0.1	0.5		0.2	1
Croatia	0.15				0.05	0.7	0.05	0.05	1
Cyprus	0.35	0.1			0.05	0.1	0.1	0.3	1
Czech Republic	0.2	0.05		0.05		0.4		0.3	1
Denmark	0.05			0.1	0.25	0.25	0.1	0.25	1
Estonia	0.25			0.1	0.05	0.45		0.15	1
Finland		0.05	0.05		0.15	0.2	0.35	0.2	1
France	0.25					0.35	0.35	0.05	1
Germany	0.2				0.25	0.2	0.35		1
Greece	0.15		0.05			0.55	0.25		1
Hungary	0.15	0.05				0.4		0.4	1
Ireland	0.1	0.05				0.05	0.4	0.4	1
Italy	0.2	0.2				0.5	0.05	0.05	1
Latvia	0.1				0.35	0.4	0.05	0.1	1
Lithuania	0.2		0.05			0.65		0.1	1
Luxembourg	0.25	0.05	0.1	0.05			0.1	0.45	1
Malta	0.25	0.05	0.1	0.05	0.1	0.2		0.25	1
Netherlands	0.15	0.1			0.1		0.05	0.6	1
Norway	0.1				0.05	0.5		0.35	1
Poland	0.15					0.8		0.05	1
Portugal	0.5	0.1				0.35	0.05		1
Romania	0.05			0.05	0.05	0.75	0.05	0.05	1
Slovak Republic	0.05				0.05	0.7		0.2	1
Sovenia	0.05			0.05	0.05	0.6	0.15	0.1	1
Spain	0.2	0.1		0.05	0.05	0.15	0.35	0.1	1
Sweden	0.15		0.05	0.15		0.2	0.15	0.3	1
Switzerland	0.1		0.05		0.15	0.2	0.35	0.15	1
United Kingdom	0.15	0.05		0.05			0.25	0.5	1
Total	0.16	0.03	0.02	0.03	0.07	0.36	0.12	021	1

Note: Ownership structure value is presented in decimal fraction of the total. Variable definitions are presented in the Appendix.

Table 5. Correlation

	Domestic Family	Widely held	Widely held parent	State	Foreign
Firm Age	0.1250***	0.1903***	-0.1215***	-0.0608	-0.2039***
Openness	-0.0844**	-0.1185***	0.1655***	-0.1343***	0.4239***
Anti-self dealing index	-0.04	0.1052**	0.1195***	-0.1409***	0.0757*
Shareholder protection	0.0646	0.2335***	-0.0397	-0.0317	-0.278***
Employment protection	0.1125***	-0.0824*	-0.1092**	0.0357	0.0003
Block premium	-0.0416	-0.2046***	-0.077	0.1792***	0.0733
Governance index	-0.0048	0.1766***	0.1992***	-0.347***	0.1077***
Regulation index	-0.0304	-0.0248	-0.1904***	0.2386***	-0.0578
Number of listed firms	0.0481	0.173***	-0.0413	-0.104**	-0.1859***
Market capitalisation 2014	0.0505	0.1803***	0.0758	-0.201***	0.0121
Market capitalisation 2006	0.0524	0.2438***	0.1446***	-0.3352***	0.0435
Widely held firms in 1996	-0.06	0.1856***	0.1445**	-0.2249***	-0.0817
State firms in WE 1996	-0.0219	-0.0847	-0.2259***	0.259***	-0.1605**
State firms in CEE 1996	-0.1872**	-0.009	0.0222	0.0716	0.0863
LN (assets)	0.0073	0.2203***	0.1154***	-0.2171***	-0.0428
nace1	-0.0384	-0.0092	-0.0027	0.0375	-0.0152
nace2	0.0607	-0.0335	-0.0134	0.0596	0.0244
nace3	-0.0439	0.0138	0.1492***	-0.0882**	0.0469
nace4	0.0765*	-0.0244	0.0295	-0.0934**	0.0572
nace5	-0.0957**	-0.1299***	-0.1373***	0.4104***	-0.2163***
nace6	0.0576	0.0304	-0.0668	0.0104	-0.0936**
nace7	-0.0562	0.0113	0.1033**	-0.1245***	0.1342***
nace8	0.0405	-0.021	0.0082	-0.0882**	0.0469
nace9	-0.0519	-0.066	-0.0421	0.1726***	-0.1226***
nace10	-0.0326	-0.0798*	-0.089**	0.1976***	-0.1465***
nace11	-0.0411	-0.0418	-0.0456	0.075*	0.1177***
nace12	0.1688***	0.0399	0.0287	-0.2012***	0.046
nace13	0.0096	0.0304	-0.0668	0.0375	-0.0675*
nace14	0.0193	0.1771***	-0.0046	-0.098**	-0.0173
nace15	-0.0361	-0.0109	0.1784***	-0.1501***	0.1771***
naceother	-0.0499	0.0105	0.0213	-0.1022**	0.0535

Notes: *** Significant at 1%
** Significant at 5%
* Significant at 10%
Variable definitions are presented in the Appendix.

Table 6. Firm Age, Openness and Ultimate Ownership

	PROBIT												RANDOM EFFECTS									
Equations	Domestic Family		Widely held		Domestic family		Widely held		Widely held parent		Foreign		Domestic family		Widely held		Domestic family		Widely held		Widely held parent		Foreign	
Explanatory variable	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value
Firm Age	0.01	2.93	0.01	3.68									0.01	2.63	0.01	3.22								
Openness					-0.01	-2.18	0.006	-1.87	0.005	2.36	0.01	5.80					-0.01	-2.00	0.00	-1.68	0.00	2.41	0.01	5.10
LN (assets)	-0.04	-0.56	0.19	3.01	-0.15	-1.55	0.14	2.12	0.13	2.15	0.01	0.20	-0.06	-0.94	0.23	3.06	-0.19	-2.03	0.19	2.42	0.11	1.80	0.00	0.00
nace1	0.00		-0.51	-1.33	0.00		-0.61	-1.23	0.02	0.05	0.26	0.84	-4.45	-0.00	-0.31	-0.44	-5.29	-0.00	-0.35	-0.54	-0.05	-0.09	0.24	0.52
nace2	0.75	1.99	-0.27	-0.57	0.70	1.77	-0.25	-0.55	0.21	0.49	0.14	0.34	0.75	1.67	-0.26	-0.44	0.77	1.55	-0.33	-0.54	0.24	0.54	0.14	0.36
nace3	0.00		-0.02	-0.04	0.00		0.16	0.43	1.13	3.38	0.25	0.83	-4.77	-0.00	0.01	0.03	-5.41	-0.00	0.12	0.23	1.33	3.10	0.53	1.26
nace4	0.81	1.86	-0.64	-3.57	0.40	0.77	0.00		0.36	0.79	0.49	0.97	0.85	1.75	-0.69	-1.07	0.53	0.84	-6.23	0.00	0.41	0.90	0.63	1.30
nace5	-0.49	-1.13	-1.10	-3.04	0.00		-1.16	-2.88	-0.39	-1.24	-0.62	-2.23	-0.53	-1.18	-1.27	-2.34	-5.50	-0.00	-1.20	-2.35	-0.37	-1.25	-0.64	-2.58
nace6	0.93	1.68	0.44	0.88	0.69	1.03	-0.13	-0.22	0.00		-1.12	-1.97	1.02	1.91	0.77	1.33	0.60	1.08	-0.07	-0.10	-5.03	-0.01	-1.09	-1.87
nace7	0.00		0.17	0.43	0.00		0.21	0.55	0.70	1.90	0.83	2.21	-4.40	-0.00	0.24	0.59	-5.30	-0.00	0.25	0.61	0.71	2.03	0.89	2.23
nace8	0.65	1.35	-0.05	-0.09	0.35	0.73	-0.05	-0.09	0.39	0.84	0.21	0.67	0.70	1.39	-0.02	-0.04	0.41	0.77	-0.08	-0.15	0.47	1.05	0.39	0.91
nace9	0.00		0.00		0.00		0.00		-0.12	-0.27	-1.13	-3.46	-4.55	-0.01	-6.59	0.00	-5.66	-0.00	-6.04	0.00	-0.13	-0.29	-1.34	-2.74
nace10	-0.07	-0.13	0.00		0.00		0.00		0.00		-1.75	-3.53	-0.13	-0.26	-7.00	0.00	-5.55	-0.00	-6.12	0.00	-4.89	-0.01	-1.59	-2.97
nace11	-0.11	-0.22	-0.32	-0.94	0.00		-0.47	-1.26	-0.03	-0.10	0.76	2.31	-0.16	-0.32	-0.30	-0.66	-5.50	-0.00	-0.41	-0.89	0.01	0.04	0.95	3.01
nace12	0.86	2.90	0.11	0.45	0.66	2.41	0.06	0.20	-0.08	-0.27	0.01	0.04	0.85	2.96	0.18	0.67	0.56	1.73	0.05	0.16	-0.03	-0.11	-0.02	-0.10
nace13	0.38	0.82	0.64	1.37	0.21	0.44	0.57	1.23	0.00		-1.14	-1.94	0.35	0.53	0.83	1.53	0.16	0.24	0.67	1.15	-4.82	-0.01	-1.29	-1.92
nace14	0.38	1.34	0.41	1.89	0.38	1.10	0.30	1.54	0.03	0.13	-0.34	-1.74	0.40	1.34	0.50	2.08	0.42	1.34	0.37	1.46	0.02	0.07	-0.26	-1.11
nace15	0.10	0.29	-0.10	-0.42	0.00		0.60	1.13	-0.08	-0.16	0.15	0.27	0.10	0.16	-0.07	-0.15	-4.57	-0.00	0.43	0.78	0.12	0.25	0.02	0.03
Naceother	0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00	
Constant	-1.30	-1.17	-4.43	-4.25	1.52	0.92	-2.87	-2.36	-3.39	-3.45	-1.70	-1.64	-1.02	0.96	-5.27	-4.31	2.05	1.26	-3.74	-2.77	-3.19	-3.05	-1.67	-1.50
Log likelihood	-143.63		-185.89		-101.15		-154.81		-208.90		-243.96		-141.13		-178.61		-99.09		-151.56		-206.16		-236.98	
No. obs.	538		556		295		434		443		480		600		600		480		480		480		480	

Note: Variable definitions are presented in the Appendix.

Table 7a. Investors Protection, Labor Protection and Ultimate Ownership: Widely Held Firms

	PROBIT								RANDOM EFFECTS							
Equations	Widely held		Widely held		Widely held		Widely held		Widely held		Widely held		Widely held		Widely held	
Explanatory variable	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value
Anti-self dealing index	0.43	0.76							0.45	0.65						
Shareholder protection			2.11	1.73							2.09	1.63				
Employment protection					-0.29	-1.08							-0.19	-0.50		
Block premium							-2.65	-3.19							-2.59235	-1.93
LN(assets)	0.23	2.65	0.17	1.98	0.20	2.65	0.23	2.17	0.26	3.18	0.18	2.26	0.24	3.08	0.300269	2.4
nace1	-0.52	-1.16	0.03	0.12	-0.64	-1.39	-0.61	-1.31	-0.26	-0.40	0.19	0.20	-0.26	-0.39	-0.37764	-0.54
nace2	0.01	0.02	0.00		-0.22	-0.47	0.00		-0.02	-0.04	-5.06	0.00	-0.25	-0.43	-4.89295	-0.01
nace3	-0.18	-0.50	0.37	1.31	0.10	0.29	-0.22	-0.55	-0.23	-0.36	0.28	0.50	0.10	0.20	-0.24394	-0.37
nace4	-0.37	-1.90	-0.47	-3.15	-0.49	-2.32	-0.35	-1.71	-0.60	-0.89	-0.6	-0.91	-0.66	-1.01	-0.61183	-0.84
nace5	-0.97	-2.32	-1.14	-2.37	-1.09	-2.65	-0.94	-1.92	-1.04	-1.97	-1.17	-2.16	-1.18	-2.30	-1.04897	-1.77
nace6	0.52	0.99	1.00	1.62	0.34	0.63	0.64	0.72	0.67	1.18	1.08	1.48	0.58	1.03	0.792221	0.78
nace7	-0.25	-0.39	0.23	0.36	0.18	0.40	-0.58	-1.07	-0.19	-0.37	0.18	0.38	0.30	0.73	-0.5831	-1
nace8	0.25	0.40	0.09	0.11	-0.03	-0.05	0.00		0.34	0.53	0.08	0.12	-0.03	-0.05	-5.0671	0
nace9	0.00		0.00		0.00		0.00		-5.65	0.00	-5.35	0.00	-6.52	0.00	-5.08802	-0.01
nace10	0.00		0.00		0.00		0.00		-5.71	0.00	-5.34	-0.01	-6.62	0.00	-5.16563	-0.01
nace11	-0.28	-0.76	-0.37	-0.93	-0.42	-1.18	-0.23	-0.55	-0.26	-0.56	-0.33	-0.63	-0.40	-0.87	-0.22061	-0.43
nace12	0.28	0.99	-0.12	-0.35	0.15	0.52	-0.02	-0.07	0.26	0.94	-0.16	-0.51	0.15	0.57	-0.01541	-0.05
nace13	0.53	0.81	0.00		0.57	1.23	0.90	1.27	0.68	0.97	-4.75	0.00	0.79	1.39	0.891965	1.03
nace14	0.40	1.42	0.03	0.09	0.30	1.26	0.42	1.18	0.41	1.57	0.06	0.19	0.39	1.60	0.419274	1.4
nace15	-0.19	-0.65	0.00		-0.31	-1.12	0.00		-0.18	-0.39	-5.89	0.00	-0.23	-0.49	-5.72989	0
naceother	0.00		0.00		0.00		0.00		0.00		0		0.00		0	
Constant	-5.13	-3.72	-4.68	-4.03	-3.52	-2.39	-4.57	-2.47	-5.73	-4.28	-4.95	-4.16	-4.59	-2.85	-5.86116	-2.69
Log likelihood	-158.33		-106.30		-182.30		-110.51		-153.41		-105.73		-175.41		-108.13	
No. observations	463		281		500		274		500		320		540		300	

Note: Variable definitions are presented in the Appendix.

Table 7b. Investors Protection, Labor Protection and Ultimate Ownership: Widely Held Parent Firms

	PROBIT								RANDOM EFFECTS							
Equations	Widely held parent		Widely held parent		Widely held parent		Widely held parent		Widely held parent		Widely held parent		Widely held parent		Widely held parent	
Explanatory variable	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value
Anti-self dealing index	0.89	0.04							1.08	1.58						
Shareholder protection			-1.95	-1.29							-1.84	-1.05				
Employment protection					-0.45	-1.39							-0.63	-1.76		
Block premium							-0.10	-0.15							-0.31	-0.26
LN (assets)	0.04	0.56	0.09	1.29	0.07	1.15	0.01	0.09	0.04	0.55	0.07	0.81	0.05	0.81	-0.01	-0.08
nace1	-0.16	0.71	0.00		-0.24	-0.58	0.34	0.88	-0.24	-0.48	-5.09	-0.01	-0.31	-0.61	0.18	0.33
nace2	0.11	0.80	0.43	0.73	-0.22	-0.44	0.00		0.23	0.49	0.35	0.59	-0.25	-0.52	-5.75	0
nace3	1.23	0.00	1.14	2.41	1.11	3.66	1.20	2.56	1.41	3.08	1.61	2.64	1.34	3.17	1.65	2.76
nace4	0.17	0.70	0.13	0.22	0.30	0.67	-0.11	-0.22	0.28	0.61	0.55	0.94	0.49	1.17	0.23	0.31
nace5	-0.70	0.02	-0.53	-1.43	-0.70	-2.31	-0.27	-1.03	-0.64	-2.05	-0.49	-1.29	-0.66	-2.17	-0.09	-0.21
nace6	0.00		0.00		0.00		0.00		-5.02	-0.01	-5.36	-0.01	-5.22	-0.01	-5.98	0
nace7	0.74	0.06	0.91	2.41	0.40	0.97	1.02	2.41	0.70	1.81	0.98	2.08	0.39	1.03	1.02	2.25
nace8	0.14	0.79	0.53	0.78	0.24	0.56	0.00		0.24	0.47	0.63	1.09	0.38	0.85	-5.71	0
nace9	-0.67	0.14	0.10	0.26	-0.59	-1.31	0.00	-0.01	-0.70	-1.24	0.03	0.06	-0.65	-1.13	0.11	0.16
nace10	-0.79	0.13	0.00		-0.88	-1.75	-0.24	-0.44	-0.74	-1.38	-5.12	-0.01	-0.86	-1.63	-0.05	-0.08
nace11	-0.27	0.44	0.07	0.18	-0.26	-0.80	0.41	1.08	-0.08	-0.23	0.23	0.51	-0.09	-0.25	0.75	1.7
nace12	0.16	0.60	0.23	0.55	0.13	0.42	0.30	0.79	0.22	0.86	0.23	0.73	0.19	0.77	0.42	1.37
nace13	0.00		0.00		0.00		0.00		-4.93	-0.01	-5.17	0.00	-5.20	0.00	-5.74	0
nace14	-0.07	0.76	0.09	0.32	-0.08	-0.39	0.19	0.59	-0.05	-0.22	0.03	0.11	-0.08	-0.36	0.35	1.09
nace15	0.93	0.00	0.00		0.89	3.29	0.00		1.12	2.68	7	0.00	1.07	2.61	7.82	0
naceother	0.00		0.00		0.00		0.00		0.00		0		0.00		0	
Constant	-1.80	0.07	-1.48	-1.48	-0.74	-0.51	-1.19	-0.63	-2.03	-1.78	-1.32	-1.03	-0.23	-0.17	-1.09	-0.49
Log likelihood	-224.44		-138.75		-238.69		-137.67		-215.64		-131.72		-229.60		-128.47	
No. observations	484		292		521		286		500		320		540		300	

Note: Variable definitions are presented in the Appendix.

Table 8. Country Governance, Regulation and Ultimate Ownership

	PROBIT								RANDOM EFFECTS							
Equations	Widely held		Widely held parent		Widely held		Widely held parent		Widely held		Widely held parent		Widely held		Widely held parent	
Explanatory variable	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value
Governance index	0.05	0.19	0.38	2.21					0.09	0.30	0.48	1.86				
Regulation index					1.34	2.57	-1.44	-3.41					1.38	2.22	-1.51	-2.86
LN (assets)	0.21	2.79	-0.01	-0.22	0.32	4.64	-0.04	-0.83	0.24	2.83	-0.04	-0.54	0.33	4.12	-0.04	-0.74
nace1	-0.56	-1.25	-0.16	-0.40	-0.62	-1.34	-0.10	-0.25	-0.24	-0.36	-0.23	-0.47	-0.35	-0.54	-0.2	-0.4
nace2	-0.26	-0.62	-0.05	-0.12	-0.44	-0.98	-0.10	-0.22	-0.28	-0.47	-0.03	-0.08	-0.39	-0.66	-0.07	-0.17
nace3	0.09	0.25	1.01	3.29	0.01	0.04	1.12	3.12	0.09	0.18	1.24	3.02	0.06	0.12	1.28	3.17
nace4	-0.56	-3.12	0.26	0.57	-0.62	-3.34	0.18	0.40	-0.67	-1.02	0.45	1.10	-0.71	-1.08	0.37	0.91
nace5	-1.12	-3.01	-0.62	-2.37	-1.32	-3.20	-0.69	-2.49	-1.20	-2.34	-0.59	-2.09	-1.31	-2.56	-0.64	-2.31
nace6	0.35	0.67	0.00		0.06	0.10	0.00		0.60	1.05	-6	0.00	0.38	0.66	-5.41	-0.01
nace7	0.08	0.20	0.50	1.58	0.09	0.23	0.57	1.75	0.17	0.45	0.5	1.54	0.17	0.43	0.54	1.68
nace8	-0.06	-0.11	0.15	0.35	-0.15	-0.24	0.11	0.25	-0.05	-0.08	0.26	0.61	-0.09	-0.16	0.22	0.51
nace9	0.00		-0.32	-0.90	0.00		-0.34	-1.01	-6.55	0.00	-0.34	-0.76	-5.89	0.00	-0.36	-0.81
nace10	0.00		-0.95	-1.92	0.00		-1.00	-1.97	-6.64	0.00	-0.93	-1.81	-6.04	0.00	-0.97	-1.93
nace11	-0.42	-1.26	-0.27	-0.83	-0.50	-1.45	-0.34	-1.05	-0.41	-0.90	-0.17	-0.52	-0.46	-1.03	-0.24	-0.71
nace12	0.02	0.08	0.01	0.03	0.00	0.01	-0.04	-0.14	0.08	0.30	0.06	0.27	0.07	0.28	0.03	0.15
nace13	0.55	1.19	0.00		0.52	1.11	0.00		0.72	1.31	-5.91	0.00	0.65	1.18	-5.26	-0.01
nace14	0.34	1.47	-0.13	-0.66	0.31	1.30	-0.10	-0.53	0.43	1.81	-0.15	-0.70	0.41	1.73	-0.13	-0.62
nace15	-0.34	-1.25	0.71	2.54	-0.43	-1.53	0.90	3.55	-0.25	-0.53	0.82	2.20	-0.30	-0.66	0.95	2.64
naceother	0.00		0.00		0.00		0.00		0.00		0		0.00		0	
Constant	-4.52	-4.05	-0.99	-1.08	-8.11	-4.92	1.95	1.72	-5.26	-4.21	-0.84	-0.87	-8.55	-4.45	2.01	1.37
Log likelihood	-191.52		-272.64		-186.10		-267.20		-183.53		-264.94		-181.28		-262.88	
No. observations	556		580		556		580		600		600		600		600	

Note: Variable definitions are presented in the Appendix.

Table 9. Financial Development and Ultimate Ownership

	PROBIT												RANDOM EFFECTS									
Equations	Widely held		Widely held		Widely held		Widely held parent		Widely held parent		Widely held parent		Widely held		Widely held		Widely held		Widely held parent		Widely held parent		Widely held parent	
Explanatory variable	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value
No listed	0.00	2.54					0.00	-0.72					0.00	2.54					0.00	-0.72				
Marketcap2014			0.00	2.18					0.00	-0.01					0.00	2.18					0.00	0.99		
Marketcap1996					0.00	0.03					0.00	-0.12					0.00	2.23					0.00	-0.12
LN(assets)	0.15	1.60	0.13	1.12	0.17	0.08	0.08	0.95	0.03	0.30	0.06	0.77	0.15	1.60	0.13	1.12	0.17	1.78	0.08	0.95	0.03	0.76	0.06	0.77
nace1	-0.44	-1.07	0.00		-0.39	0.35	-0.14	-0.34	0.38	0.76	-0.11	-0.27	-0.44	-1.07	0.00		-0.39	-0.94	-0.14	-0.34	0.38	0.45	-0.11	-0.27
nace2	-0.09	-0.19	0.02	0.04	0.00	1.00	-0.18	-0.33	-0.08	-0.15	0.10	0.23	-0.09	-0.19	0.02	0.04	0.00	0.00	-0.18	-0.33	-0.08	0.88	0.10	0.23
nace3	0.37	1.28	0.38	1.31	-0.22	0.56	0.99	2.44	0.82	2.10	1.15	3.07	0.37	1.28	0.38	1.31	-0.22	-0.58	0.99	2.44	0.82	0.04	1.15	3.07
nace4	-0.36	-2.08	-0.17	-0.70	-0.30	0.11	0.10	0.18	-0.48	-0.67	0.06	0.14	-0.36	-2.08	-0.17	-0.70	-0.30	-1.61	0.10	0.18	-0.48	0.50	0.06	0.14
nace5	-1.08	-2.59	-0.78	-1.75	-0.90	0.03	-0.98	-2.21	0.00		-0.70	-2.32	-1.08	-2.59	-0.78	-1.75	-0.90	-2.15	-0.98	-2.21	0.00		-0.70	-2.32
nace6	0.41	0.69	1.01	1.54	0.52	0.33	0.00		0.00		0.00		0.41	0.69	1.01	1.54	0.52	0.97	0.00		0.00		0.00	
nace7	-0.37	-0.68	-0.43	-0.77	-0.43	0.54	0.68	1.76	0.59	1.49	0.71	1.82	-0.37	-0.68	-0.43	-0.77	-0.43	-0.61	0.68	1.76	0.59	0.14	0.71	1.82
nace8	0.01	0.02	0.20	0.28	0.26	0.67	0.00		0.00		0.13	0.25	0.01	0.02	0.20	0.28	0.26	0.43	0.00		0.00		0.13	0.25
nace9	0.00		0.00		0.00		-0.28	-0.77	-0.38	-0.64	-0.69	-1.54	0.00		0.00		0.00		-0.28	-0.77	-0.38	0.52	-0.69	-1.54
nace10	0.00		0.00		0.00		-0.81	-1.50	-0.75	-1.31	-0.82	-1.59	0.00		0.00		0.00		-0.81	-1.50	-0.75	0.19	-0.82	-1.59
nace11	-0.28	-0.75	-0.41	-0.72	-0.27	0.46	-0.31	-0.90	-0.40	-0.99	-0.23	-0.68	-0.28	-0.75	-0.41	-0.72	-0.27	-0.74	-0.31	-0.90	-0.40	0.32	-0.23	-0.68
nace12	0.05	0.17	0.13	0.45	0.18	0.51	-0.02	-0.05	-0.03	-0.09	0.09	0.28	0.05	0.17	0.13	0.45	0.18	0.66	-0.02	-0.05	-0.03	0.93	0.09	0.28
nace13	0.62	0.85	0.00		0.57	0.41	0.00		0.00		0.00		0.62	0.85	0.00		0.57	0.83	0.00		0.00		0.00	
nace14	0.43	1.42	0.45	1.58	0.38	0.18	-0.20	-0.74	-0.47	-2.46	-0.01	-0.07	0.43	1.42	0.45	1.58	0.38	1.34	-0.20	-0.74	-0.47	0.01	-0.01	-0.07
nace15	-0.19	-0.65	-0.20	-0.79	-0.36	0.24	0.74	2.33	0.61	2.52	0.91	3.04	-0.19	-0.65	-0.20	-0.79	-0.36	-1.18	0.74	2.33	0.61	0.01	0.91	3.04
naceother	0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00	
Constant	-3.64	-2.32	-3.42	-1.78	-4.28	0.01	-2.02	-1.44	-1.18	-0.71	-1.79	-1.47	-3.64	-2.32	-3.42	-1.78	-4.28	-2.81	-2.02	-1.44	-1.18	0.48	-1.79	-1.47
Log likelihood	-152.87		-133.27		-156.47		-201.04		-162.66		-227.49		-147.42		-126.36		-152.06		-189.15		-152.67		-216.86	
No.observations	409		333		463		419		314		484		440		360		500		440		360		500	

Note: Variable definitions are presented in the Appendix.

Table 10. Path Dependency and Ultimate Ownership

	PROBIT						RANDOM EFFECTS					
	Widely held		State		State		Widely held		State		State	
	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value	Coeff.	z-value
Widely held firms in 1996	1.27	2.64					1.18	1.95				
State firms in WE 1996			1.49	3.24					1.61	2.46		
State firms in CEE 1996					-0.47	-1.07					-0.43	-0.64
LN (assets)	-0.05	-0.39	-0.10	-0.92	0.32	2.28	0.03	0.18	-0.1	-0.78	0.29	1.82
nace1	-0.46	-0.92	0.43	0.97	0.00		-0.25	-0.36	0.33	0.61	5.96	0.00
nace2	0.16	0.29	-0.32	-0.40	0.70	1.47	0.06	0.08	-0.3	-0.47	0.73	1.18
nace3	-0.25	-0.51	0.00		-0.72	-1.17	-0.25	-0.38	-5.3	0.00	-0.89	-1.24
nace4	0.00		0.00		-1.19	-1.77	-5.64	0.00	-5.3	0.00	-1.17	-1.66
nace5	-0.66	-1.44	1.57	3.93	1.33	3.58	-0.75	-1.34	1.6	4.15	1.46	3.63
nace6	0.96	1.11	0.00		0.21	0.47	1.02	1.05	-5.4	0.00	0.21	0.35
nace7	-0.50	-0.98	-0.50	-0.83	0.00		-0.46	-0.76	-0.5	-0.78	-5.52	-0.01
nace8	0.66	0.72	0.00		-0.97	-1.70	0.67	0.87	-5.6	0.00	-1.15	-1.74
nace9	0.00		0.00		1.13	2.41	-5.64	0.00	7.19	0.00	1.29	2.31
nace10	0.00		1.71	2.94	1.69	4.21	-5.57	0.00	1.81	2.74	1.76	2.80
nace11	-0.25	-0.58	0.60	1.37	0.62	1.11	-0.23	-0.44	0.59	1.39	0.68	1.56
nace12	0.23	0.68	-0.31	-1.05	-0.52	-1.15	0.24	0.79	-0.2	-0.74	-0.47	-0.90
nace13	0.56	0.87	0.89	1.09	0.32	0.46	0.56	0.65	1.03	1.27	0.45	0.65
nace14	0.23	1.09	0.03	0.11	0.01	0.03	0.28	1.01	0.07	0.26	0.07	0.17
nace15	-0.48	-0.91	0.00		0.00		-0.30	-0.43	-5.1	0.00	0.00	
naceother	0.00		0.00		0.00		0.00		0		0.00	
Constant	-0.47	-0.22	0.56	0.31	-4.49	-2.41	-1.82	-0.80	0.18	0.10	-4.11	-1.96
Log likelihood	-115.01		-111.52		-84.75		-114.10		-111.15		-83.73	
No. observations	241		231		170		256		256		176	

Note: Variable definitions are presented in the Appendix.