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INNOVATION PERFORMANCE AND CORPORATE GOVERNANCE IN EUROPE: A NEW PERSPECTIVE

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Abstract

This study takes the challenge to settle the omnipresent question of the ownership's impact on firms' innovativeness. For years, researchers have debated, whether disperse or concentrated ownership impacts, and if yes, then how, the firm's innovation performance. Our implications provide a systematic view on the ownership and innovativeness of European organizations. We test the external factors like the power distance and decentralization that moderate the principal-agent relationship, and lastly shape firm's innovation strategy. In the final remarks we provide guidelines of good governance for both top shareholders and executives, promoting the closure of innovation gap in Europe.

Distance Index (PDI) and decentralization have a positive and fostering impact on the relationship between disperse ownership and executives. Hence, we hypothesize:

H4a. Disperse ownership in countries with lower Power Distance Index (PDI) has a positive impact on executives.

H4b. Disperse ownership in organizations with decentralized decision-making has a positive impact on executives.

The innovative managers can be the most “potent weapon in a battle against competition” for any organization (Kanter, 2004). Hence, it is important to investigate as to how different types of executives impact on organizational innovation performance. Furthermore, owners object the managers’ behavior, as they presume that managers, since bearing only a small portion of the costs from of their managerial decisions, prefer to enhance their private benefits of control. Similarly, managers’ relation to innovation underlies same rules. Aghion et al. argued that managers, with respect to innovation, can take some decisions that are not stimulating it up to the optimal level to reduce the risk of failure (Aghion et al., 2009). However, any business owner, intended to continue and grow own business, needs managers. These executives’ profile should match with the organization’s strategy and business culture (Klein & Bell, 2007). A requirement for successful collaboration between owners and managers, can be granted, when both parties see a higher utility in achieving organizational goals rather than their individual goals. The agency theory, or stewardship theory explain the various motivations of owners and managers, however, it would be unfair to put all types of owners or managers in the same basket, drawing generic conclusions. To our knowledge, we are the first, testing as to how the interaction between owners and managers evolves in organizations, where the agency dilemma is of a high probability, including the moderating factors of this relationship like the Power Distance Index (PDI) and decentralization, also distinguishing between the

three various types of executives and their attitude towards firm's innovation performance. In this study we do not assume the "nature" of different types of managers, but instead investigate their behavior (Chrisman, Chua, Kellermanns, & Chang, 2007), drawing our final conclusions. So what drives these opportunistic executives to promote innovation within their organization?

Non-Family Executives

The non-family related executives are present at all levels of the management in an organization, starting with the junior positions, through the middle management positions, and reaching up to the senior executives' level. Previous research points out on the non-family executives' self-actualization as a motivation to action. Personal development, career opportunities or personal wealth can be an effective drive for non-family managers, and its lack at the workplace, leads to their dissatisfaction and limited commitment (Block & Jaskiewicz, 2007). Non-family executives tend to consume high levels of private benefits, bearing lower costs from their failures, but also gaining lower profits from their successes. Factors like the unfair redistribution of rents, or too strict monitoring, can adversely affect their efforts and productivity (Klein & Bell, 2007). The agency theory sees the non-family managers as agents, imposed to the agency cost control mechanisms, that is reflected in their increased performance (Chrisman et al., 2007), this holds true also with regard to their attitude towards innovation and growth. Hence, we hypothesize:

H5a. Non-family executives make strategic decisions that positively impact firm's innovation performance in low PDI countries.

H5b. Non-family executives make strategic decisions that positively impact firm's innovation performance, when the decision making system within their organization is decentralized.

Family Executives

The relationship between owners and management is rather a complex one, and it can get more complex when the family connotations come into play. Earlier research shows that family executives tend to “subordinate personal goals to family goals, pursue non-financial goals, and abide by relational contracts that govern family firm behavior” (Chrisman et al., 2007). Therefore, the family executives have a lower motivation to consume private benefits. However, the oppose voices in the literature say, that “asymmetric altruism and self-control problems of parents could create unique agency problems for family firms” (Chrisman et al., 2007). The organizations owned and led by families have a specific business culture (Klein & Bell, 2007), and “the owner’s and family members tend to hold an antipathy concerning innovation and growth, often explained by a strong emotional attachment” (Klein & Bell, 2007). Thus, we hypothesize:

H6a. Family executives make strategic decisions that negatively impact firm’s *innovation* performance in low PDI countries.

H6b. Family executives make strategic decisions that negatively impact firm’s *innovation* performance, when the decision making system within their organization is decentralized.

Foreign Executives

Foreign executives appointed to work in local organizations, demonstrate that they serve local interests. In spite of significant cultural differences, they are hired to compete against expatriates representing foreign multinationals in the domestic markets of their local employers (Arp, 2013). Foreign executives get appointed for their firm expertise and skills, typically, they stay in the local organization for the duration of a specific project, with a view to be replaced by local successors (Arp, 2013). Since the purpose of their stay is ‘getting something done’, they tend to be very result oriented and perform up to high organizational standards. The literature links the foreign executives with the

concept of the ‘global mindset’, which is defined as “the cumulative cognitive abilities and outlook of an organization’s executive team (Levy, Beechler, Taylor, & Boyacigiller, 2007). Employees, teams or managers with a ‘global mindset’ tend to be more open to new cultures, diversity, take leadership in the times of high uncertainty, negotiate skillfully in conflicts and unleash boundaries (Arp, 2013). Furthermore, having all these qualities, foreign executives as members of executive teams with global mindset, positively impact on the organizational performance, i.e. including a larger percentage of revenues from foreign markets, and significantly more foreign business partners and customers (Nummela, Saarenketo & Puumalainen, 2004). Their close relation to the foreign market fosters their ability of bringing innovations from the foreign to the local market. Thus, we hypothesize:

H7a. Foreign executives make strategic decisions that positively impact firm’s *innovation* performance in low PDI countries.

H7b. Foreign executives make strategic decisions that positively impact firm’s *innovation* performance, when the decision making system within their organization is decentralized.

3. EMPIRICAL STUDY

3.1. DATA AND VARIABLES

This paper analyzes how EU organizations with disperse ownership innovate and how the Power Distance Index (PDI) and decentralization moderate this relation. By the EU organizations we refer to organizations belonging to the European Member States included in our empirical analysis, i.e. Austria, France, Germany, Hungary, Italy, Spain and the UK. The data used in our analysis is provided by Bruegel-Unicredit collected within the European Firms in a Global Economy project (EFIGE) supported by the Directorate General Research of the European Commission (Altomonte & Aquilante,

2012). Bruegel is European think tank with a mission to improve quality of economic policy and promote data-driven research.

The EFIGE project aimed at gathering qualitative and quantitative information at the firm-level of EU organizations' internal policies and external competitiveness. It has been coordinated by Bruegel, and carried out from September 2008 to August 2012. Scientific partners of the project include some National Central Banks (Bundesbank, Bank of France, Bank of Italy, Bank of Spain, Bank of Belgium) and international institutions (OECD) (Altomonte & Aquilante, 2012).

EFIGE data is capturing the outcomes of international operations, and contains variables *inter alia* on the firm's governance, R&D and technological innovation. Data collection has been performed through a survey carried out in 2010 by GFK, the fourth largest market research company in the world. The questionnaire submitted to the firms covered six different broad areas, these are: (1) structure of the firm (company ownership, domestic and foreign control, management); (2) workforce (skills, type of contracts, domestic vs. migrant workers, training); (3) investment, technological innovation and R&D (and related financing); (4) export and internationalization; (5) market structure and competition; and (6) the financial structure and bank-firm relationship. The information collected is cross-sectional for the budget year 2008. Survey questions correspond to the period 2007-09 and the firms' behavior during the 2007 financial crisis. EFIGE dataset utilized in our analysis is truncated preventing firms' identification with anonymized regions and industries. In total 14,758 organizations having more than 10 employees were surveyed. In our models we use the firm-level EFIGE data on ownership and innovation performance together with the Power Distance Index (PDI) from The Culture Compass dataset by Hofstede for countries relevant to our analysis.

Dependent binary variables utilized in our analysis representing innovation performance are the following: product innovation, process innovation and patent application. Binary variables due to their nature take the value of 1 if an EU organization reports its involvement in the respective innovative activities, or 0 otherwise. Specifically, for the variable ‘product innovation’ if the EU organization reports having introduced a good that is new or significantly improved to the firm, it takes the value of 1, or 0 if otherwise. Similarly for the variable ‘process innovation’ if they declare a new production technology which is either new or significantly improved to the firm, it takes the value of 1, or 0 if otherwise. At last, when it comes to the variable ‘patent application’ it takes the value of 1 when EU organization reports having applied for patents in the corresponding institutions in their countries, and 0 if otherwise. In table 1 the distribution of innovative activities related to product and process innovation, and patent application across countries is presented:

Country	Absolute number	Innovation	Product Innovation	Process Innovation	Patent Application	No Innovation
Austria	443	76.07	59.14	58.24	19.41	23.93
France	2,973	57.15	44.27	37.61	11.67	42.85
Germany	2,935	65.93	49.98	40.20	15.78	34.07
Hungary	488	56.35	43.85	33.61	4.30	43.65
Italy	3,020	68.54	49.21	44.80	14.24	31.46
Spain	2,832	70.94	45.59	51.45	11.19	29.06
UK	2,067	67.63	58.49	46.59	13.98	32.37
Total sample	14,758	65.88	49.09	44.00	13.23	34.12

Table 1: Distribution of innovative activities of EU organizations by countries (%)

Overall, 65.88% of firms from the sample, reported any of the three types of innovation activities distinguished in our research. The highest number of organizations pioneering in innovation origin from Austria, these are followed by the organizations from the countries like Spain, Italy, the UK, Germany, France and Hungary. Austrian firms report the most innovation in either product, process or patent applications from all

organizations. Interestingly, the second position with regard to product innovation takes up the UK with 58.49% of firms reporting product innovation, it is not much below the Austrian firms, and outruns German organizations by 8.51%. When it comes to the process innovation, Spanish organizations are positioned right after Austrian, with 51.45% of Spanish organizations reporting process innovations. German organizations take up the second position after Austrian organizations with 15.78% of German organizations reporting patent applications, followed close behind by Italian organizations with 14.24% of them reporting patent applications.

Independent variables, constructed to test our presumptions, are the ‘ownership concentrated of 100 % of shares’ as a benchmark for those organizations without the agency problem, ‘ownership concentrated from 21 % up to 99 % of shares’ and ‘ownership disperse from 0 % up to 20 % of shares’. The cut point at 20% of shares or less, owned by the first top shareholder for dispersedly owned organizations, corresponds to the common practice in the literature (Burkart & Panunzi, 2006). However, observing the ownership structure of European organizations, additionally, we have constructed an independent binary variable referring to the disperse ownership, where the first top shareholder owns 50% of shares or less. This perspective on ownership dispersion is related to the fact that on average EU organizations tend to have a less dispersed ownership structure. Nonetheless, organizations characterized by ownership with this level of dispersion, i.e. 50% of shares or less owned by the first top shareholder, face more governance challenges than those with highly concentrated ownership, i.e. 51% of shares or more owned by the first top shareholder. These challenges arise because the first top shareholder is giving away a part of the decisive power to the other shareholders, probably as a result of the venture’s financing issues, and to get it back, needs to engage in creating coalitions and agreements with other shareholders. The endorsement from

other shareholders can substantially help the first top shareholder pursuing own strategic vision for the whole organization. Furthermore, the relation between principal and agent, in this case of dispersedly owned organizations, is looser and control mechanisms over management might be costlier than expected by the owners.

All the independent variables, if they meet the conditions of belonging to the respective range for the shares owned by the first top shareholder, take the value of 1, or 0 if otherwise. Again, the ranges we talk about here are, (1) if the first top shareholder owns 100% of shares, (2) or if the first top shareholder owns more than 21% up to 99% of company's shares, (3) for those organizations with disperse ownership, where the first top shareholder owns up to 20% of shares, (4) if the first top shareholder owns up to 50% of shares. Again, categorizing EU organizations at the cut-point of 20% of shares or less owned by the first top shareholder narrows our sample to 585 organizations. Despite, it is a common practice in the earlier literature (Burkart & Panunzi, 2006), after a deliberate analysis, we have decided to move this cut-point up to the 50% of shares or less owned by the first top shareholder as a measure for disperse ownership in EU organizations. We have two supporting arguments for our choice here. Firstly, the sample for EU organizations at the cut-point of 50% of shares or less increases from 585 to 5,656 observations, which also increases the viability of our results. Secondly, the EU organizations owned by owners with less than 50% of shares, are highly exposed to the agency dilemma, as these owners need to continuously deal with other shareholders asking for their agreement, or fighting for strategic power. Hence, the sample of firms with disperse ownership at the cut-point of 50% of shares or less can be utilized for the purposes of this study.

The table 2 presents the distribution of the two samples with disperse ownership at the two cut-points of 20% versus 50% of shares or less for the first top shareholder:

Independent Variables (Binary)	Sample (Obs. 14,074)	Sample (%)	Mean (SE)
Ownership disperse 0 % up to 50 % of shares	Obs. 5,656	40.25	.4025 (.4904)
Ownership disperse 0 % up to 20 % of shares	Obs. 585	4.16	.0416 (.1998)

Table 2: Comparing the two levels of disperse ownership (At 50% of shares or less versus disperse ownership at 20% of shares or less)

Furthermore, we confirm that ownership dispersion and innovation performance, are a subject to Power Distance Index (PDI) and decentralization. As discussed above, both measures have moderating impact on disperse ownership and innovation performance. The Power Distance Index (PDI) is “a measure of the interpersonal power or influence between the superior and subordinate as perceived by the subordinate, the less powerful of the two, subordinate” (Hofstede et al., 2010). Specifically, for countries from our sample we have utilized the PDI as quantified by Hofstede and presented in the table 3 below:

	Austria	France	Germany	Hungary	Italy	Spain	UK
Power Distance Index	11	68	35	46	50	57	35

Table 3: Power Distance Index by G. Hofstede (Hofstede, 2014)

Legend:

0-25 Low power distance (Austria)

26-50 Medium low power distance (Germany, Hungary, Italy, UK)

51-75 Medium high power distance (France, Spain)

75-100 High power distance (no representation in our sample)

Austrian organizations that seem to engage in innovation most frequently comparing to the other organizations from our sample, additionally, as assessed by Hofstede, operate in the country with the lowest PDI worldwide. Other countries like

Germany, Hungary, Italy, and the UK are categorized medium-low PDI, whereas France and Spain belong to the group of medium-high PDI, representing the highest power distance between superiors and inferiors within their organizations as to comparing to power distance of other EU organizations. In our sample we do not have any organizations with high PDI, i.e. above the value of 75, typically, it corresponds to organizations from the developing economies.

Power distance at the business unit level, as we debate, is reflected in decentralization, similarly to Power Distance Index (PDI) by Hofstede, it has a moderating effect on the relationship between ownership dispersion and innovation performance. In this study ‘decentralization’ takes the value of 1 if managers can take autonomous decisions in some business areas, or 0 if otherwise. Precisely, this decisive autonomy reflects lower power distance between the principal and agent with respect to a particular organization’s culture (Aghion et al., 2015).

At last, to understand better the relationship between owners with disperse ownership and executives in an organization, we are running more tests, to analyze how this interrelation impacts executives’ decision-making on innovation performance in an organization, both moderated by PDI and decentralization. Therefore, created and utilized three various binary variables that correspond to the three types of executives, we have taken into account in our study. Firstly, the variable ‘non-family executives’ takes the value of 1 if the executives (included middle management), who are a part of the workforce of EU organization in its home country in 2008, are not related to the family who owns the company, or 0 if otherwise. Secondly, the variable ‘family executives’ takes the value of 1 if the executives (included middle management), who are a part of the workforce of EU organization in its home country in 2008, are related to the family who owns the company, or 0 if otherwise. At last, the variable ‘foreign executives’ takes

the value of 1 if an organization reports having foreign employees (both EU and non-EU citizens) amongst their executives (included middle management), or 0 if otherwise.

Table 5 presents correlation matrix for the variables that put together our model. We use the ‘tetrachoric’ command in Stata to test multicollinearity for all binary variables, except for PDI, technology intensity, firm size and firm age, which are categorical variables. Our results show negative correlation between product innovation, process innovation and patent application and disperse ownership. Factors like PDI and decentralization is, respectively, negatively and positively correlated with EU organizations’ innovation performance. The two types of executives, i.e. non-family and foreign executives, are positively correlated with innovation performance, the exception are family executives, which have a negative impact on EU firms’ innovation performance. Internal R&D, a control variable from our model, is rather highly correlated with product innovation, process innovation and patent application, but still less than the problematic level of (0.75) (Tsui et al., 1995). The EFIGE questionnaire has been constructed in a way to omit the selection bias issue for the innovation performance variables, i.e. product innovation, process innovation and patent innovation, and the internal R&D. The correlation values among other variables, i.e. technology intensity, firm size and firm age, is generally low, suggesting low collinearity risks. Moreover, the variance inflation factor VIF for all the models remains below 1.17, far below the critical value of 10.

Table 4 presents the distribution of the whole sample of EU organizations by product innovation, process innovation and patent application by the four types of industries, as classified by Pavitt taxonomy¹, and three categories of firm size² and firm age. We observe that more technology intensive industries innovate more often into product, processes and apply for patents. Interestingly, a high number of 47.11% of EU organizations from the medium-low technology sector innovate in their processes. It can be related to the nature of the business in this sector, which is related to economies of scale industries producing basic materials and consumer durables. Indeed, product and process innovation differ in many ways, this difference is also evident when considering the EU organizations' age. Surprisingly, older EU firms, operating for longer than 20 years on the market, tend to innovate more in product, whereas EU organizations younger than 6 years innovate more in their production technologies.

	Product Innovation	Process Innovation	Patent Application
Low technology	44.30	41.74	8.83
Medium-low technology	48.91	47.11	13.45
Medium-high technology	57.26	44.20	21.20
High technology	69.14	48.46	25.00
Small	45.24	40.66	9.24
Medium	58.64	52.15	21.73
Large	65.76	58.87	34.66
Less than 6yrs	47.75	45.35	11.98
Between 6 and 20yrs	46.93	43.15	11.69
More than 20yrs	50.57	44.34	14.33

Table 4: Distribution for technological intensity, age and size for innovation performance for the whole sample (%)

¹ Pavitt taxonomy consists of four categories, i.e. (1) low technology intensive traditional industries, (2) medium-low technology intensive economies of scale industries producing basic materials and consumer durables, (3) medium-high technology intensive sector of specialized industries producing technology to be sold into other firms, and (4) high technology industries.

² Firm size is categorized into three categories: (1) the small firms have up to 50 employees, (2) medium firms up to 250 employees and (3) large firm more than 250 employees. Freelancers and occasional workers are excluded.

Table 5 presents the descriptive statistics for variables used in our models:

Variable	Obs.	Mean	SE	Min	Max
Product innovation	14,758	.4909	.4999	0	1
Process innovation	14,758	.4399	.4964	0	1
Patent application	14,758	.1323	.3389	0	1
Ownership concentrated 100 % of shares	14,052	.2889	.4533	0	1
Ownership concentrated 21 % up to 99 % of shares	14,052	.6694	.4705	0	1
Ownership disperse 0 % up to 20 % of shares	14,052	.0416	.1998	0	1
Ownership disperse 0 % up to 50 % of shares	14,052	.4025	.4904	0	1
PDI	14,759	48.58	13.97	11	68
Decentralization	14,237	.2910	.4542	0	1
R&D Internal	14,758	.4753	.4994	0	1
Technology Intensity	14,075	1.7815	.9087	1	4
Firm size	14,759	1.3175	.5886	1	3
Firm age	14,759	2.5067	.6255	1	3

Table 5: Descriptive statistics

Please note results of table 6 can be provided by request

3.2. EMPIRICAL MODEL

Due to binary nature of the majority of our variables, we use the ‘logit’ or ‘probit’ regressions as our estimation models, in line with common statistical practice (Frazier, 2004). Testing the moderating variables’ effect on disperse ownership and innovation performance or executives, we follow the methodology by Aiken and West (Aiken & West, 1991). The interaction variables, for the purpose of this analysis, have been mean-centered (Dawson, 2014) and labelled as ‘disperse ownership by PDI’ and ‘disperse ownership by decentralization’, or ‘executives by PDI’ and ‘executives by decentralization’.

3.3. RESULTS

Our results show that ownership dispersion or concentration solely does not predict firm’s innovative performance. Testing for two opposite ownership levels in our model, i.e. ownership up to 20% of shares versus ownership from 21% up to 99% of shares, we find out that the disperse ownership has a negative, but insignificant, impact on product

innovation and patent application, whereas ownership concentration, a positive, but insignificant impact on the both (table 7 and 9). The process innovation differs from product innovation and patent application, and is impacted positively by both disperse and concentrated ownership, however, significant only for in the case of the first mentioned (table 8). The results for the benchmark, i.e. EU organizations owned by one top shareholder with 100% of shares, shows a negative effect on all innovative activities taken into account in our study, and significant only for process innovation. This result can be interpreted as a sign of the existence of the stewardship in those EU organizations, where no agency problem exists. The first top shareholder, at the expense of own profits, takes decisions for the benefit of all stakeholders, and this is reflected her negative impact on firm's innovation performance (Chrisman et al., 2007).

Contrasting with the earlier literature (Francis et al., 1995), our result shows the positive and significant impact of disperse ownership's on process innovation. Therefore, we have decided to investigate it closely, testing in what circumstances the EU organizations exposed to the agency dilemma, can innovate successfully. However, as the unit of analysis of 'disperse ownership' in this study, we use the cut-point of 50% of shares or less owned by the first top shareholder as justified in the section above. Table 10 presents the results of disperse ownership's at 50% of shares or less impact on EU organizations' innovation performance in terms of product innovation, process innovation and patent application. These results are comparable with the results of the disperse ownership of 20% of shares or less, that also proves the robustness of our model. We utilize the sample of 5,656 EU organizations with disperse ownership at 50% of shares for the first top shareholder, drawing relevant conclusions. To further show causality of the influence of exogenous factors like PDI and decentralization, we run additional tests

(tables 11, 12 and 13) including these moderating variables' and verifying their impact on EU organizations' disperse ownership and innovation performance.

Please note results of table 7 to 10 can be provided by request

The tables 11, 12 and 13 present our results of three models including the moderating effect of PDI and decentralization on the relationship between disperse ownership and innovation performance. Thus, PDI has negative influence on the dependent variables, and decentralization a positive effect in all three models. We interpret these results as the following: the lower the power distance between the superiors and inferiors at a country level, and the business unit level, the more innovative the EU organization is. The difference in sign of coefficients here is explained by the reserve effect of PDI on innovation performance, i.e. the lower the PDI, the lower the distance of power perceived by the subordinates, and the more proactive they are in finding new innovate solutions.

Herewith, we also analyze the effect of the interaction term of the ownership dispersion by PDI and decentralization on EU organizations' innovation performance. What we observe, is that, PDI does not play a significant role for product innovation, however, when the disperse ownership is moderated by decentralization, it has a negative effect on firm's product innovation. This means that an increase of one unit in 'disperse ownership by decentralization' decreases the probability for the EU organization to innovate in product by 6.3 percentage points. In relation to process innovation, we find the contrary evidence, i.e, PDI has a positive and significant moderating effect on EU organizations' disperse ownership in relationship with the process innovation. We observe that an increase of one unit in 'disperse ownership by PDI' increases the probability for EU organization to innovate in process by 0.2 percentage point. Furthermore, the moderating effect of decentralization on disperse ownership and process

innovation is insignificant, so the results of moderating effect of PDI and decentralization on patent applications are.

Considering the control variables, our results show, the positive and highly significant impact of ‘internal R&D’ on EU organizations’ innovative performance. ‘Technology intensity’ has a positive and significant effect on both product innovation and patent application, whereas negative on process innovation. EU organizations, operating in less technology intense sectors, innovate more in their processes than products, nor apply much for patents. Moreover, EU organization’s size does play an import role when it comes to innovation performance. Larger EU firms tend to innovate more, or report more innovation than smaller EU organizations. Indeed, the innovation performance of EU organizations from our sample is based on self-reported measures. It could be that larger, more bureaucratic firms are more likely to measure and report innovation if it occurs. In a large firm, a change in standardized routines may carry with itself disproportionately high adjustment costs, in a small firm, the way things are organized may be changed without that being considered something out of the ordinary. At last, EU firms younger than 6 years tend to innovate more in technology processes than EU organizations older than 20 years old, and similar independency has been found for product innovation and patent application, but the results there are insignificant.

Please note results of table 11 to 13 can be provided by request

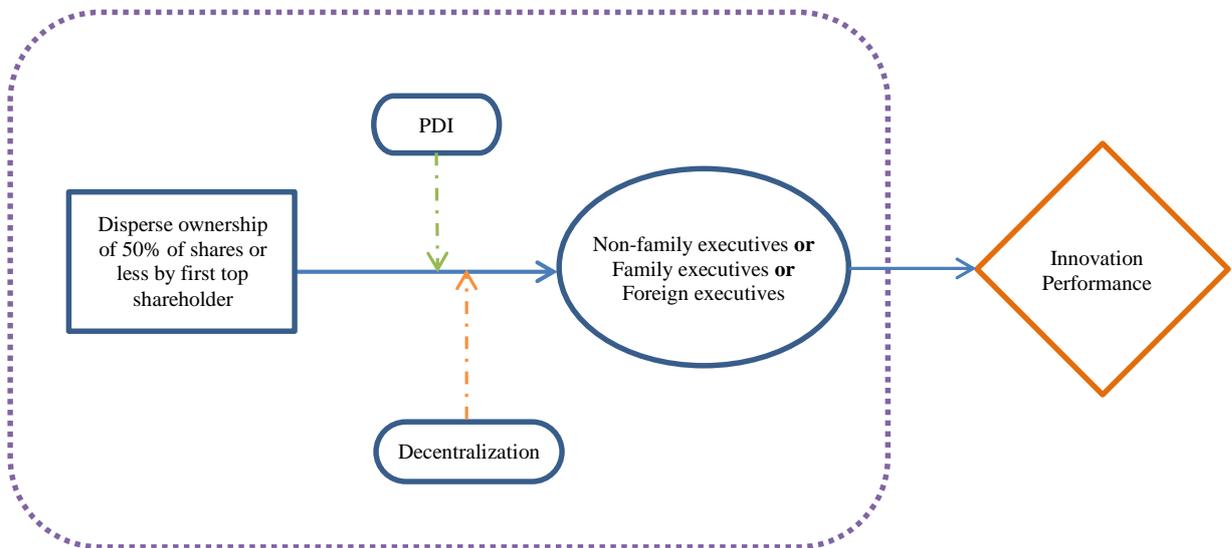
In any case, it couldn’t go unnoticed that in all three models (table 11, 12 and 13) the ‘decentralization’ has a stronger moderating effect on the relationship between disperse ownership and innovation performance than PDI. Following our intuition and justifying our presumptions about the importance of ‘decentralization’, we have run additional models (table 14, 15 and 16) testing how it moderates the relationship between owner with disperse power and their agents, in the countries categorized as medium-high

PDI versus medium-low PDI, i.e. the group of EU organizations from France and Spain versus the group of EU organizations from Germany, Hungary, Italy and the UK. Comparing the two oppose groups of EU organizations, we find that ‘decentralization’ does play an important role there, especially in the countries of medium-high PDI, where its effect is stronger than in the EU organizations from the latter group. For instance, in EU organization from the medium-high PDI country, an increase of one unit in ‘decentralization’ increases the probability for this organization to innovate in product by 4.3 percentage points, whereas by 3.8 percentage point for the EU organization from the medium-low PDI country. However, the moderating effect of ‘decentralization’ on product innovation is negative and significant, i.e. an increase of one unit in ‘disperse ownership by decentralization’ decreases the probability for this organization to innovate in product by 7.1 percentage points, whereas by 5.0 percentage point for the EU organization from the medium-low PDI country. Precisely, decentralization itself positively impacts product innovation of EU organization, but not when it is owned by the first top shareholder with 50% of shares or less. Furthermore, we test the coefficients for the linear restriction of ‘disperse ownership by decentralization’ (table 22 of the appendix), contrasting the two groups of EU organizations, confirming that analogous conclusion can be withdrawn for them.

Please note results of table 14 to 16 can be provided by request

Although, our results present a more complete picture for the study of disperse ownership and EU organizations’ innovative performance, we intent to look as close as possible at the agency problem within these organizations. Therefore, we add the variables for ‘non-family executives’, ‘family executives’ and ‘foreign executives’ into our next models and run a two-step analysis, firstly testing how disperse ownership moderated by either PDI or ‘decentralization’ impacts on these three types of executives,

secondly, we input our results into our next models to test on how this interaction shapes the EU organizations' innovation performance. The results of this analysis are presented in the tables 18, 19, 20 and 21.



Graph 1: Research model with the three executives' types

Ultimately, disperse ownership has a negative effect on non-family executives and foreign executives, i.e. an increase of one unit in 'disperse ownership' decreases the probability for EU organization having both the non-family executives and foreign executives by -10.7 percentage points. The moderating variables PDI and 'decentralization' impact on this relationship by diminishing the negative effect of disperse ownership. When 'disperse ownership' is moderated by PDI, an increase of one unit in 'disperse ownership' increases the probability for EU organization having the non-family executives from -10.7 percentage point up to -3.0 percentage points, and for the foreign executives up to -1.0.

In the case of 'disperse ownership' being moderated by 'decentralization', we observe a similar interdependency, i.e. the increase of 'disperse ownership by decentralization' decreases the negative effect 'disperse ownership' has on 'non-family executives' from -11.2 percentage point up to -3.8 percentage point. Similarly, for foreign

executives, i.e. an increase of ‘disperse ownership by decentralization’ decreases the negative effect ‘disperse ownership’ has on ‘foreign executives’ from -10.7 percentage point up to 2.1 percentage point, however the result of its interaction term ‘disperse ownership by decentralization’ is insignificant.

Interestingly, our results for family executives show the contrary. Here, the ‘disperse ownership’ has a positive effect on the family executives, and an increase of one unit in ‘disperse ownership’ increases the probability for EU organization having family executives by 7.9 percentage points. The Power Distance Index (PDI), for this particular case, has a diminishing effect on the relationship between ‘disperse ownership’ and ‘family executives’, decreasing the positive effect of its interaction down to 2.0 percentage points. We observe a similar interdependency for this relationship, when moderated by decentralization, however, its effect is not as harmful as of PDI, and the decrease of probabilities jumps from 7.6 percentage point down to 6.1 percentage point.

Moreover, the moderating variables PDI and ‘decentralization’ have opposite effects depending on different types of executives. For Power Distance Index (PDI) we observe the negative impact on non-family executives. The interpretation of this result, however, lies in the reverse effect of PDI, i.e. the lower the PDI, the more positive impact it has on the EU organizations’ innovation performance as claimed by Hofstede (Hofstede et al., 2010). For family executives and foreign executives, PDI has a positive and weak impact on the both, i.e. the lower the PDI than the lower the probability for EU organization having family executives and foreign executives.

Furthermore, assessing our results for ‘decentralization’ brings new insights into the matter debated. What we can observe here is that, ‘decentralization’ has a positive and significant effect on both the non-family executives and foreign executives, but a negative and significant effect on family executives, i.e. the more decentralized decision-

making within a firm is, the lower the probability for EU organization having the family executives, managing its operations.

Our results present an interesting phenomenon. We find the contrary evidence for the non-family versus family executives, their interaction with disperse ownership, also when moderated by Power Distance Index (PDI) and ‘decentralization’. The foreign executives, however, remain a mix of the two other types, and at times show some similarities with one type or the other.

The second step in our analysis is assessing how the above described relationships for all the three types of executives’ impact on EU organizations’ innovation performance. Our results presented in the tables 19, 20 and 21, are mixed, however, we can observe a certain trend. Thus, as a consequence of the outcome of the interaction between ‘disperse ownership’ and ‘non-family executives’, we observe a positive impact of the latter on product innovation, and when this interaction is modified by ‘decentralization’, then the result is also highly significant. On the contrary, the consequence of the outcome of the interaction between ‘disperse ownership’ and ‘family executives’, is their negative attitude towards product innovation, regardless if moderated by PDI or decentralization. The foreign executives present the negative relationship with product innovation and switch to the positive and highly significant one when moderated by ‘decentralization’.

Moreover, non-family and foreign executives in low PDI environment do not favor process innovation, however, their relationship to process innovation changes, when they have a more autonomous decisive power within their EU organization, and turns out positive. The family executives have a more complicated relationship with process innovation. They seem to favor it in low PDI environment, but our result here is insignificant, and once given an opportunity to take own strategic decisions, they tend to disregard it.

All the three types of executives when they interact with the owners of their EU organization in the condition of low PDI, as a result seem to overlook the opportunities coming out of patent applications, but our findings here are insignificant. Despite, the non-family and foreign executives in the more decentralized EU organizations, encourage patent applications within their organizations. Family executives in the same circumstances act in the opposite way, having a negative impact on their EU organization's patent application. Table 17 presents the overview of the hypotheses tested in this study.

	Product innovation		Process innovation		Patent application	
H1	Supported		Not supported ³		Supported	
H2	Not supported		Supported		Not supported	
H3	Not supported		Not supported		Not supported	
	Non-family executives		Family executives		Foreign executives	
H4a	Not supported		Supported		Not supported	
H4b	Not supported		Supported		Not supported	
	Two-step analysis					
	Non-family executives		Family executives		Foreign executives	
	H5a	H5b	H6a	H6b	H7a	H7b
Product innovation	Not supported	Supported	Supported	Supported	Not supported	Supported
Process innovation	Not supported	Supported	Not supported	Supported	Not supported	Supported
Patent application	Not supported	Supported	Not supported	Supported	Not supported	Supported

Table 17: Summary of results

Please note results of table 18 to 21 can be provided by request

4. DISCUSSION

In this study, we aimed to find a solid answer to the question as to what factors drive innovation performance in dispersedly owned organizations, alleviating the costs of the agency. Reviewing the literature, we have realized that these factors could be the Power Distance Index (PDI) by Hofstede and decentralization. Both measures capture the power distance between the superiors and inferiors at either a specific country, or business unit

³ Our results are significant for two levels of ownership's impact on process innovation, i.e. the disperse level where the first top shareholder owns up to 20% of shares or less, or up to 50% of shares or less, and the concentrated level of ownership by 100% of shares, therefore, our hypothesis is rejected

level, and this power distance moderates the perception of individuals or a group of individuals, their decision-making and behavior throughout the extended period of time.

The results of our empirical analysis corroborate that disperse or concentrated ownership solely does not play a significant role on product innovation or patent application. However, it does, for process innovation, and process innovation is positively impacted by disperse ownership, but negatively by concentrated ownership, and both results remain significant.

When assessing the PDI's impact on disperse ownership, we observe that its moderating effect is positive and significant only in these EU organization that are involved in process innovation. Contrary to our predictions, decentralization has a negative and significant impact on product innovation in EU organizations owned by the first top shareholder who is not having the majority of shares of this organization. Desired to learn more about decentralization's impact on disperse ownership and innovation performance, we have contrasted a sample of EU organizations operating in medium-high versus medium-low PDI with each other. Again, our results confirm the negative and significant impact of decentralization on product innovation, and this effect seems to be more harming for EU organizations operating in medium-high PDI countries.

Furthermore, this study, to our knowledge, is the first to investigate the relationship between owner with disperse power over own organization and the three different types of managers, and further test as to how this interaction resonates in organizational innovation performance. Related to PDI, as in line with the previous models, it has a positive and significant impact on non-family executives, however, unexpectedly, our results show its negative and significant impact on family executives and foreign executives. Non-family executives thrive in EU organizations of the low PDI countries (Austria, Germany, the UK, Hungary and Italy), whereas the family and foreign

executives in the medium-high PDI (France and Spain) countries. Related to decentralization, its positive and significant effect is evident on non-family executives and foreign executives, whereas negative and significant on family executives. The more decentralized decision-making in EU organization, the lower the probability that it will be managed by family executives.

Interestingly, the disperse ownership once moderated by PDI or decentralization show the oppose effects on the non-family versus family executives, whereas remains insignificant for foreign executives. Here, disperse ownership by PDI has a negative and significant effect on non-family executives, whereas positive and significant on family executives, and same interdependency is observed once disperse ownership is moderated by decentralization.

Berle and Means, the recognized forerunners in the study of Modern Corporation, emphasized that within an organization with disperse ownership structure, managers may enforce non-value maximizing strategies to preserve individual interest rather than the one of shareholders (Shleifer & Vishny, 1988). The agency theory proposes a way, in which owners can minimize the costs of agency dilemma, and it is by imposing a strong incentive systems or an effective control mechanisms, or by reducing the delegation of authority. However, the stewardship theory tackles this phenomenon from a different perspective. Accordingly, managers, given a choice, will act as a steward, in the best interest of their stakeholders. Furthermore, their motivation is aligned to that of their principal as they see a greater utility in the cooperative behavior. Hence, the principal steward relation is built upon mutual trust and their collaboration aims to oversight for the goals and strategies of a company, and foster their implementation (Cornelius, 2005). The two theories conflict in their implications for executives' behavior with regard to the imposition of agency cost control mechanisms on managers. If managers behave more

like agents, one should observe: (1) agency cost control mechanisms being imposed on managers; and (2) firm performance improving as a result. Conversely, if managers behave more like stewards then one should observe the relative absence of agency cost control mechanisms and a negative relationship between their imposition and performance. (Chrisman et al., 2007).

If we assume that the above presumptions hold for executives of EU organizations, we can interpret our results as follows: in low PDI countries executives tend to act as stewards, specifically family executives and foreign executives in relation to product innovation, and the non-family executives and foreign executives in relation to process innovation. Furthermore, in EU organizations with decentralized decision-making, the family executives turn into stewards, whereas the non-family and foreign executives remain agents.

To complete our discussion, we need to bring up the concept of cognitive dissonance at this stage too (Demangeot & Broderick, 2010; Klein & Bell, 2007). The research on social relationships finds that over time, within the same relationship, parties will have different encounters with different intentions that lead to different outcomes, which sometimes foster trust and sometimes distrust (Lewicki, McAllister, & Bies, 1998). The debate here, is around the idea as to what extent principals and agents remain rational in their actions, which could be an interesting future research direction for building a firmer understanding of human factors that drive principals' and agents' behavior and interaction with each other.

5. CONCLUSION

Organizations execute innovative activities, succeeding or failing on the way. This study analyzes as to how successful EU organizations implement innovation, aiming to guide the non-implementers for reaching their desired innovation outcomes. Certainly,

innovation is an important component of the EU organizations' success today, but their competitive advantage of tomorrow will be the ability to quickly implement any innovations at a lower adjustment cost.

As the results of our study show, many factors, both at the environment level and at the firm level, can play a role here. For example, ownership is a key factor impacting organizational innovation performance. Also, factors like PDI and decentralization provide opportunities for EU organizations to boost their innovation performance. In this article we analyze the impact of different levels of EU organizations' ownership on their innovative performance including the cross-sectional differences and the impact of national cultural elements.

Institutions do matter for EU organizations' innovative performance. Countries with a national culture expressed by low PDI are more system-fixing oriented and any time that something is wrong, either product or process, they invest in new technologies in order to fix the system. Furthermore, EU organizations with disperse ownership have proven their ability to innovate successfully.

Product and process innovation, and patent applications are innovative strategies, interfaced between organizational strategic focus and development. EU organizations' sources of competitive advantage should be found in the creation of new patterns to quick implementation, the development of organizational competence and their appropriate use in daily operations. More specifically, the EU institutions should enhance policies encouraging synergies between the low power distance Member States with those of higher power distance in terms of innovation.

Furthermore, owners of the EU organizations from the lower power distance environments by utilizing opportunities presented in our model may opt for more inclusive corporate decision-making strategies, whereas the owners of EU organizations

from the medium high power distance environments may utilize the presented model to positively influence their organizational culture and lower employees' resistance to change, finally increasing firm's innovation performance.

A clear focus, persistent implementation with skillful risk management for mitigating the burden of unsuccessful innovative outcomes is needed to ensure appropriate manager's decisions about innovation. Kinship matters. Especially, mixing business and family can become a challenging ride. The evidence given in our paper opposes the entrenchment hypothesis and the assumption of manager's preference for a "quiet life". Nonetheless, the tradeoff of giving a certain decision-making autonomy to managers lies in the risk that shareholders assess with own wealth. Owners' interaction with management is triggered by their position in the organization. Possibly that having a concentrated power, they won't be willing to share it, even if it may harm the organization's innovative performance.

Limitations for our analysis are related to the cross-sectional EFIGE data. This database is truncated providing censored information about employment at 500 employees and categorical variables for the year of establishment (<6 years; 6-20 years; >20 years). Moreover, we have limited information about the occurrence of dual-class shares and for this reason we cannot distinguish the class of shares top shareholders from our sample own that would determine their voting rights. Finally, a limit regarding patent data is that it does not provide information about all innovative affairs, because not all innovation is patented.

The future research could address the various ownership types' impact EU organizations innovative performance and what are the differences among countries and types. The use of longitudinal data might give an interesting outcome for the relation between ownership and innovation performance.

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